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PERFORMANCE SPECIFICATION

Automated Configuration Management System (ACMS)

This specification is approved for use by the Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Materiel Systems Analysis Activity, Acquisition & Technology Support Division, Attn: AMXSY-T, Rock Island, IL 61299-7260 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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1. SCOPE

1.1 Scope.

This specification covers performance requirements for the U.S. Army's Automated Configuration Management System (ACMS). It defines the functional requirements for ACMS, interface characteristics, and the environment in which it must operate.

1.2 ACMS Overview.

1.2.1 ACMS Purpose.

The ACMS will provide the Army with a next-generation configuration management and product data management system. It will enable greater access to and sharing of enterprise product data[1] in support of Integrated Product Teams (IPTs), reprocurement activities, engineering change processing, operations and maintenance activities, and disposal activities. The primary enhancements ACMS will provide include the following:

- *Storage and Use*. ACMS will extend the data types stored and managed to include, for example, engineering models, simulations, and other forms of intelligent product data.
- *Rapid Retrieval*. ACMS will enhance the user's ability to rapidly find, retrieve, and control access to product data.
- *Process Automation*. ACMS will support automation of business processes such as baseline and release approval, engineering change processing, Technical Data Package (TDP) validation, and integrated product development as supported by IPTs.

1.2.2 ACMS Scope.

ACMS will be the Army's enterprise configuration management and product data management system. The combined capabilities of ACMS will support traditional configuration management functions, product structure management, product data management, engineering change action processing, the Army's Tech Loop functions, and interfaces with the Joint Computer Aided Acquisition and Logistics Support (JCALS) Workflow Manager and multiple repository systems such as the Joint Engineering Data Management Information and Control System (JEDMICS) and Contractor Integrated Technical Information Service (CITIS) systems. ACMS will enable management of the Army's product data throughout the system life cycle -- from program development through production, sustainment, modification, and ultimately disposal.

1.2.3 ACMS Vision.

ACMS will provide the required data when it is needed and in a form that the user can apply to accomplish the mission. The required data consists of all the product data necessary to

[1] This performance specification uses the term "product data" to refer to all documents and metadata related to a product's requirements, design, implementation, and support. The term "document" has the same meaning as that used in MIL-STD-2549: A self-contained body of information or data which can be packaged for delivery on a single medium. Examples of documents include drawings, reports, standards, databases, application software, and engineering designs. "Metadata" are elements of information that describe data, such as document identifier, date, owner, release level, format, keywords, data location, approval authorizations, part identifier, and part name.

completely define an item for the intended purposes of specifying, designing, analyzing, manufacturing, maintaining, sustaining, testing, inspecting, and dispositioning that item over its entire life span. The ACMS also must operate in a diverse Army environment, integrate with other Army major subordinate command (MSC) business processes, and communicate with other MSC, government, and industry information management systems.

1.2.4 ACMS Users, Support Agencies, and Implementing Sites.

The Army Materiel Command (AMC) Engineering Data Management System (EDMS) Functional Coordinating Group (FCG) ACMS Task Force, as established by the AMC Deputy Chief of Staff for Research, Development and Acquisition, is responsible for defining ACMS and developing this Performance Specification. The Performance Specification describes the target ACMS. In the near term, implementing sites will tailor these requirements to meet local needs and to reflect the state of the industry at the time of implementation.

Each of the Army's MSCs will be responsible for developing its local ACMS implementation. The EDMS Program Management Office will coordinate and monitor implementations, and validate that the local implementations meet the requirements of this Performance Specification. Potential implementation sites include the following:

- ❑ Aberdeen Proving Ground, MD: Chemical and Biological Defense Command (CBDCOM)
- ❑ Anniston, AL: Anniston Army Depot (ANAD)
- ❑ Corpus Christi, TX: Corpus Christi Army Depot (CCAD)
- ❑ Ft. Monmouth, NJ: Communications and Electronics Command (CECOM)
- ❑ Huntsville, AL: Aviation and Missile Command (AMCOM)
- ❑ Letterkenny, PA: Letterkenny Army Depot (LEAD)
- ❑ Natick, MA: Soldier Systems Command (SSCOM)
- ❑ Orlando, FL: Simulation, Training & Instrumentation Command (STRICOM)
- ❑ Picatinny Arsenal, NJ: Tank-automotive and Armaments Command (TACOM) Army Research, Development and Engineering Center (ARDEC)
- ❑ Rock Island, IL: Rock Island Arsenal (RIA) and Industrial Operations Command (IOC)
- ❑ Texarkana, TX: Red River Army Depot (RRAD)
- ❑ Tobyhanna, PA: Tobyhanna Army Depot (TYAD)
- ❑ Warren, MI: TACOM Headquarters
- ❑ Watervliet, NY: Watervliet Arsenal (WVA)

The ACMS user community includes configuration managers, design engineers, developers, testers, trainers, logisticians, National Inventory Control Points or item managers, and manufacturers to include organic depots and arsenals. Potentially, anyone involved in an IPT, evaluating change actions, or retrieving product data for any reason, is an ACMS user. These users are located at the MSCs, the ARDECs, the depots and arsenals, and at weapons system developer sites.

1.2.5 ACMS Operation.

ACMS will be a federated system of systems. It will be federated in the sense that local sites will manage their own data and support their site unique business processes. It is a system of systems in the sense that all sites will share standard metadata (see Appendix D) that describe the managed product data and will possess capabilities that are common to the whole of ACMS.

As the Army's enterprise product data management system, ACMS will provide visibility into the identity and location of all controlled product data whether the Army has change control authority or not. The long-term goal is that all controlled product data, including changes and metadata, will be visible to any ACMS user who is authorized to see, use, or revise the data.

ACMS represents a shift in the Army from document-centric data management to product-centric data management. Users will locate and retrieve data from a product structure perspective rather than from a document perspective. This change will enable users to identify desired product data by navigating product structures, searching for and through part families, as well as by traditional approaches such as querying data grouping or classification attributes. Product-centric data management also means that the product structure is a controlled item in addition to, or in place of, documents describing the product structure (for example, the Bill of Materials).

The target ACMS will provide a core set of standard, Army-wide data elements and capabilities, to include the following:

- *Provide a Single Access and Control Point*. ACMS will provide users with a single, common means of finding, accessing and controlling Army enterprise-level product data for which the Army has change control authority.
- *Promote Sharing of Data*. ACMS will provide users with concurrent access to product data where the data and the users may be geographically dispersed.
- *Implement Data Standards*. ACMS will read and write MIL-STD-2549 data information packets as a means for exchanging product configuration management metadata and product structure relationships with Product Data Management (PDM), Configuration Management (CM), authoring, CITIS, and repository systems.
- *Manage Multiple Formats*. ACMS will provide for the management of a wide variety of product data formats in accordance with MIL-STD-2549 -- to include Computer Aided Design (CAD) model formats -- so that government- and contractor-created data can be maintained, located, and used with no loss of data intelligence.
- *Automate Product Data Management*. ACMS will automate Army product data management functions to include data capture, storage, location, retrieval, access control, and transmittal, as well as configuration management of data, quality control of data, and system administration.
- *Manage Army-Controlled Product Structures*. ACMS will provide for creating, storing, maintaining, and managing changes to links (relationships) between elements of product structures (for example, parts, components, and assemblies) for which the Army is the Current Document Change Authority (CDCA).

- *Access Contractor-Controlled Product Structures*. As a long-term goal, ACMS will provide the ability to find, copy, view, and print product structures when the Army is not the CDCA.
- *Associate Product Structure Elements With Appropriate Product Data.* ACMS will provide for creating, storing, and controlling the associations between product structures and the product data that describe the elements of product structures for which the Army is the CDCA. ACMS will provide the ability to find, copy, view, and print the associations for which the Army is not the CDCA.
- *Manage Workflow*. ACMS will provide for work process definition, routing, status tracking, and performance analyses of modeled processes.
- *Provide Configuring Capabilities*. ACMS will be flexible and customizable in its ability meet the unique information needs of individual MSCs. ACMS will provide system administrator-level tools for configuring ACMS to support information interchange within an Army site in accordance with each site's business processes and product data needs, while providing core information for off-site users. These tools will permit configuring the system without writing source code or recompiling unaffected software modules.
- *Provide Customization and Integration Capabilities*. ACMS will be flexible and customizable in its ability meet the unique functional needs of individual MSCs and to interact with other data management systems. ACMS will provide customization and integration tools for tailoring ACMS to extend existing functionality, add new functions, provide new methods for interacting with users, and interface with other data management systems, data authoring systems, and viewing systems.

Specific applications of ACMS are discussed further in the appendices. Appendix A, ACMS Concept Overview, provides information relative to the nature and roles of the ACMS. Appendix B, ACMS Support of Weapon Systems and Data Life Cycles, and Appendix C, ACMS Support to Selected Business Processes, provide information relative to the use of the ACMS.

1.2.6 Versioning and Revisioning.

The scope of ACMS encompasses both configuration and product data management. The product data management and the MIL-STD-2549 configuration management communities use different schemes for managing changes to data.

The product data management community manages data changes using a two-level release scheme. For example, a part design is at revision B when released, and as the design is revised, revision B goes through many intermediate versions (1, 2, 3, 4, etc.) until it is approved and a new revision C is finally released.

The MIL-STD-2549 configuration management community manages data changes using a one-level scheme. MIL-STD-2549 interface standard describes the configuration management processes and data elements that implement this one-level scheme. This interface standard defines documents, document representations, and files. Documents may have multiple document representations (for example, a WordPerfect representation and a Word representation). Documents and document representations have revisions, but not versions (except MIL-STD-2549 calls software revisions "software versions"). Files make up document representations, have date and time stamps in lieu of a version identifier, and have no revision or version identifier.

Since MIL-STD-2549 supports a one-level scheme, this performance specification defines requirements for a one-level release scheme based on revisions. The need to manage incremental changes to documents must be handled through business rules and the way in which vendors implement their MIL-STD-2549 interface capability.

The new business rules will constrain how the Army uses the release indicator, but this is necessary if PDM vendors are to build MIL-STD-2549 interfaces that accommodate the single tiered system defined by MIL-STD-2549. The following represents a candidate set of business rules that the Army might adopt:

- Document revisions and document representation revisions must uniquely identify incremental changes to data.
- Document revisions and document representation revisions must increment with each change in the data:
  - Files may not exist in ACMS without a document representation.
  - Any time a file changes, the document representation revision must also increment.
  - Any time a document representation revision is incremented, the document revision must also increment.
- Some document revisions and document representation revisions may never be released.

In other words, to uniquely specify incremental changes with the revision indicator, it is necessary that the Army accept that the released revisions may not follow one another in a continuous, unbroken sequence. Revision 1 through 5 (or A through E) may never be released. Revision 6 (F) might be formally approved and released. Revisions 7 through 10 (G through J) might represent incremental changes to Revision 6, but not be released. Assuming the data has sufficiently matured, revision 11 (K) might go through a formal review process and be released. As a result, the released revisions of the document are F and K.

These business rules describe an emulation of the two tiered process for tracking changed data within a one tiered system as defined by MIL-STD-2549. The one tiered system can support tracking incremental changes if the Army always increments the revision indicator with each change and if the Army is willing to accept revision values that skip between releases.

2. APPLICABLE DOCUMENTS

2.1 General.

This section specifies the documents listed in Sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in Sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government Documents.

2.2.1 Specifications, Standards, and Handbooks.

The following specifications, standards, and handbooks form a part of this document to the extent specified herein. The revisions of these documents are those listed below.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-2549 - Configuration Management Data Interface, 30 June 1997 and Errata list dated November 1997

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-61 - Configuration Management Guidance, 30 September 1997

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government Documents, Drawings, and Publications.

No other Government documents, drawings, and publications form a part of this document.

2.3 Non-Government Publications.

The following document(s) form a part of this document to the extent specified herein. The revisions of these documents are those listed below.

EIA/IS-649 - Electronics Industry Association's National Consensus Standard for Configuration Management, Revision 95 (August 1995)

(Requests for copies should be addressed to Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112.)

2.4 Order of Precedence.

In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets, or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained. The order of precedence of documents shall be as follows:

1) The procurement contract.

2) The requirements contained in this specification.
3) The requirements contained in documents referenced in this specification.

3. REQUIREMENTS

This section states ACMS performance requirements. Paragraph numbers are assigned to each requirement to support verification and traceability. The ACMS performance requirements define what operational functions the system must be able to perform, what interfaces must be provided, what ownership and support requirements must be met, and what environmental requirements will constrain ACMS operations. The requirements in this section are intended to be tailored for each local ACMS implementation. They also are intended to leave enough latitude that individual vendors may respond with their solutions as to how to best meet the requirements. Lastly, these performance requirements are written to be used as a basis for selecting a small number of qualified products to then be evaluated during a demonstration period. These requirements and the demonstration results would form the basis for developing final acceptance criteria.

3.1 Operating Requirements.

This section describes the functional features of the ACMS as seen from a user's point of view. It communicates a proposed ACMS in terms of the user needs it will fulfill, its relationship to existing systems or procedures, and the ways it will be used.

3.1.1 Product Data Management Requirements.

3.1.1.1 Data Vaulting Requirements.

3.1.1.1.1 Data Storage Requirements.

3.1.1.1.1.1	Provide Secure Data Storage	ACMS shall provide for secure storage of product data (see Appendix D) in accordance with defined access control permissions and rules (see Access Control Requirements and User Authorization and Management Requirements). Secure storage is defined as the ability to preclude stored information from being viewed, reused, updated, or deleted without invoking system rules.	P1.1	D
3.1.1.1.1.2	Store Product Data	ACMS shall provide the ability to store product data, administrative data, references to data external to ACMS, records in an associated database, and electronic displays such as Engineering Change Proposal (ECPs).	P1.2.1	D
3.1.1.1.1.3	Store CM-Controlled Product Data	ACMS shall allow the user to store product data which is not under configuration control in either a vault that does or a vault that does not overwrite data and, for product data that is under CM control, a vault that does not allow the user to overwrite data.	P1.2.3	D

3.1.1.1.2 Access Control Requirements.

3.1.1.1.2.1	Check Identify and Authorizations	ACMS shall provide for checking the identity and authorizations of users and restrict access as defined by access control permissions and rules (see User Authorization and Management Requirements).	P1.3.1	D
3.1.1.1.2.2	Suppress Unauthorized Functions	ACMS shall suppress functions not currently available to a user due to access restrictions. For example, an administrative menu tree may be accessible (e.g., highlighted and active) only to users with administrator permission.	P1.3.2	D
3.1.1.1.2.3	Provide User Feedback	ACMS shall provide a message box to notify a user that has been denied access to controlled product data or to restricted functions.	P1.3.3	D
3.1.1.1.2.4	Provide Rule-Based Access Control	Rules shall be based on user identity and defined needs, user group, user role, file type, or document release status.	P1.3.4	I
3.1.1.1.2.5	Provide Check-In Capability	ACMS shall provide the capability to check-in product data from a user's workspace to the vault in accordance with user or file permissions in such a way that created, modified, or promoted product data is placed under the security, access, change, and release control of ACMS.	P1.3.6.1	D
3.1.1.1.2.6	Partition Vaults	ACMS shall allow the system administrator to divide vaults into logical partitions.	P1.3.6.2	D
3.1.1.1.2.7	Accept Default Destination	ACMS shall provide the capability to check product data into a default logical partition without requiring the user to specify a logical partition.	P1.3.6.3	D
3.1.1.1.2.8	Permit Path Override	ACMS shall allow the user to override the system's default check-in destination and specify a particular logical partition for the check-in.	P1.3.6.4	D
3.1.1.1.2.9	Lock Checked Out Product Data	ACMS shall provide the capability to check-out product data such that it is locked and prevents multiple users from attempting to modify the product data simultaneously.	P1.3.7.2	D
3.1.1.1.2.10	Permit Copying Checked-Out Product Data	ACMS shall allow users to view and modify a copy of the product data which has been checked-out by another user. This would create a separate instance of the product data.	P1.3.7.3	D

3.1.1.1.2.11	Identify Who Is Using	ACMS shall provide the ability to view which user has checked-out product data from the vault.	P1.3.7.5	D
3.1.1.1.2.12	Provide Location-Independent Check-Out	ACMS shall allow a user to check product data out from a logical partition of a vault without requiring the user to specify the product data's location.	P1.3.7.6	D
3.1.1.1.2.13	Specify Check-Out Location	ACMS shall allow the user to specify a particular logical partition from which product data is to be checked out.	P1.3.7.6.b	D
3.1.1.1.2.14	Cancel Check-Out	ACMS shall provide the capability to cancel a "check-out" without modifying the product data.	P1.3.7.7	D
3.1.1.1.3	Metadata Management Requirements.			
3.1.1.1.3.1	Provide for Metadata Maintenance	ACMS shall provide for updating metadata so that the effects of changes, release levels, approval authorizations, and other controls are implemented.	P1.4.1	D
3.1.1.1.3.2	Track Metadata Status and Changes	ACMS shall provide for examining metadata to determine its current status and to examine the history of changes to metadata elements.	P1.4.2	D
3.1.1.1.4	Data Locating Requirements.			
3.1.1.1.4.1	Search and Navigate Product Structures	ACMS shall provide the capability to search and navigate product structures hierarchically for product data through on-screen graphical representations.	P1.5.2.1	D
3.1.1.1.4.2	Search and Navigate Product Structure	ACMS shall provide a means for viewing a product's configuration via the links established between product structure elements. This in turn is used to find a specific item within the product's configuration. In other words, navigation uses the links as a means to view a product configuration which in turn is used to find a specific item within the product's configuration.	P1.5.4	D
3.1.1.1.4.3	Provide Enterprise-Wide Navigation	ACMS shall provide the capability to locate, display, search, and navigate product structures which are stored by ACMS sites that are not the user's host ACMS site.	P3.2.0.1	D
3.1.1.1.4.4	Provide Enterprise-Wide Product Data Location	ACMS shall provide the capability to locate product data which are stored by ACMS sites that are not the user's host ACMS site.	P3.2.0.2	D

3.1.1.1.4.5	Provide Enterprise-Wide Product Data Retrieval	ACMS shall provide the capability to retrieve product data which are stored by ACMS sites that are not the user's host ACMS site.	P3.2.0.3	D
3.1.1.1.4.6	Locate Where-Used	ACMS shall provide the capability to find where a product structure element is used in all product structures. Product structures and product structure elements may be designated as CIs (see Appendix D).	P3.2.2	D
3.1.1.1.4.7	Determine Product Structure Elements Used	ACMS shall provide the capability to determine what product structure elements are used in a given product structure.	P3.2.3	D
3.1.1.1.4.8	Relate Product Data	ACMS shall provide the capability to create, navigate, and maintain links (relationships) between product data. Example links include, but are not limited to, association of product data to its source data, earlier revisions, and approved change action documents.	P1.5.3.1	D
3.1.1.1.4.9	Define Valid Relationship Types	ACMS shall provide the capability to create, modify, and delete new link types which describe relationships between product data.	P1.5.3.2	D
3.1.1.1.4.10	Relate Product Structure Elements and Product Data	ACMS shall provide the capability to create links between product structure elements and product data.	P1.5.3.3	D
3.1.1.1.4.11	Define Valid Relationship Rules	ACMS shall provide the capability to implement rules which govern the behavior of links (e.g. types of product structure elements and product data which can be associated via a particular link type).	P1.5.3.4	D
3.1.1.1.4.12	Create Groupings	ACMS shall have the capability to group like product structure elements based on a minimum set of required attributes. Each grouping will have a different set of required attributes.	P1.5.1.1	D
3.1.1.1.4.13	Arrange Groupings	ACMS shall provide the ability for product structure element groupings to be arranged hierarchically.	P1.5.1.2	D
3.1.1.1.4.14	Query Metadata	ACMS shall provide the ability to query metadata for specific values, ranges of values, and logical combinations using Boolean operations.	P1.5.2.2	D
3.1.1.1.4.15	Support Queries	ACMS shall allow for storing and retrieving queries and for creating ad-hoc queries.	P1.5.2.3	D

3.1.1.1.4.16	Support Various Query Methods	ACMS shall allow for fill-in-the-blank, wild card, and command line queries.	P1.5.2.4	D
3.1.1.1.4.17	Retrieve Based on Query Results	ACMS shall provide the capability to select and retrieve product data from the query results without additional navigation.	P1.5.2.5	D
3.1.1.1.4.18	Track Revision Compatibility	ACMS shall automatically track and maintain proper revision compatibility for documents and document representations (see Appendix D) as product data files change.	P1.5.3.5	D
3.1.1.1.5	Release Management Requirements.			
3.1.1.1.5.1	Support Electronic Approvals	ACMS shall provide for electronic indication of approval along with the name of the approver and a date and time stamp. This can be used for such processes as Engineering Change Proposal (ECP) approvals, access approvals, and release approvals. It also can indicate task completion.	P1.6	D
3.1.1.1.5.2	Track Revision and Release Status	ACMS shall maintain document and document representation revisions, document representation release status, document approval status, and date and time stamps for product data files.	P1.7	D
3.1.1.1.6	Audit History Requirements.			
3.1.1.1.6.1	Record Audit History	ACMS shall provide an audit history of all adds, changes, and deletes. All history records will have a date/time stamp and the user performing the function. History records also will include full add information, the from and to conditions for changes, and full delete information. "Full add and delete information" implies the system captures a complete record of the record that changes. "From/to change information" implies the system only captures the from and to information for the fields that change and the values of the fields that are the record keys.	P1.8.1	D
3.1.1.1.6.2	View Audit History	ACMS shall provide the capability to view all audit history records.	P1.8.2	D
3.1.1.1.6.3	Record Product Data Transport Transactions	ACMS shall provide the capability to record information about the product data transport transactions within ACMS. For example, ACMS should record the time, initiator, and recipient of the transaction.	P6.1.6	D

3.1.1.2	Workflow Management Requirements.			
3.1.1.2.1	Workflow Definition Requirements.			
3.1.1.2.1.1	Create and Save Workflow Templates	ACMS shall provide the ability to create and save pre-defined workflow templates that automate regular and repeatable processes.	P2.1.1	D
3.1.1.2.1.2	Create Ad Hoc Workflows	ACMS shall provide the ability to create ad hoc workflows that automate ad hoc processes.	P2.1.2	D
3.1.1.2.1.3	Support Workflow Steps, Timing, and Dependencies	Both predefined and ad hoc workflows shall be capable of incorporating sequential, parallel, and conditional steps.	P2.1.3	D
3.1.1.2.1.4	Specify Workflow Rules	Both predefined and ad hoc workflows shall support voting, commenting, routing, and time-out rules.	P2.1.4	D
3.1.1.2.1.5	Create Action Triggers	Both predefined and ad hoc workflows shall support creating action triggers.	P2.1.5	D
3.1.1.2.1.6	Associate Product Data	ACMS shall provide the ability to associate product data with a workflow.	P2.1.8	D
3.1.1.2.2	Workflow Execution Requirements.			
3.1.1.2.2.1	Monitor Workflow	ACMS shall provide the ability to determine the progress of a workflow and to monitor the workload of resources associated with multiple workflows.	P2.1.11	D
3.1.1.2.2.2	Highlight Late Tasks	ACMS shall provide electronic notification of tasks that have not been completed prior to the due date. Notification will be to the user that initiated the workflow task and others as required.	P2.1.12	D
3.1.1.2.2.3	Record Workflow History	ACMS shall provide for capturing information on the performance of a workflow and to review the events and results associated with the workflow.	P2.1.13	D
3.1.1.2.2.4	Check Work Queues	ACMS shall allow the users to check work queues for any workflow assigned task.	P2.1.14	D
3.1.1.2.2.5	Generate Event Notifications	Both predefined and ad hoc workflows shall be capable of generating and disseminating event notifications.	P2.1.6	D
3.1.1.2.2.6	Edit Workflow	ACMS shall provide authorized users with the ability to edit pre-defined or ad hoc workflows including during execution.	P2.1.7	D

3.1.1.2.2.7	Route Product Data via Workflow	ACMS shall provide to authorized users the ability to route product data through a defined workflow.	P2.2	D
3.1.1.2.2.8	Provide Event-Based Triggers	ACMS shall provide for the initiation of a workflow step based upon the occurrence of a pre-defined event.	P2.3	D
3.1.1.2.2.9	Distribute Product Data and Notifications	ACMS shall provide for the distribution of folders or packages and the transmission of notifications.	P2.4	D
3.1.1.2.2.10	Provide Electronic Sign-off	ACMS shall provide for electronic indication of approval or authorization. This can be used to signify task completion or product sign-off.	P2.5.1	D
3.1.1.2.2.11	Record Votes	ACMS shall record votes from the appropriate users.	P2.5.2	D
3.1.1.3	Product Structure Management Requirements.			
3.1.1.3.1	Product Structure Creation and Maintenance Requirements.			
3.1.1.3.1.1	Create and Associate Product Structure Elements	ACMS shall provide the capability to create and associate product structure elements.	P3.1.1	D
3.1.1.3.1.2	Maintain Product Structure	ACMS shall provide the capability to add, delete, or replace specific product structure elements in a product structure.	P3.1.9	D
3.1.1.3.1.3	Represent Product Structure Hierarchically	Product structure representations within ACMS shall be hierarchical.	P3.1.2	D
3.1.1.3.1.4	Maintain Product Structure Element Revisions	ACMS shall provide the capability to create and modify revisions of product structure elements. These revisions can be either released and non-released revisions.	P3.1.4	D
3.1.1.3.1.5	Accommodate Multiple Revisions	ACMS shall accommodate multiple released revisions and non-released revisions of product structure elements.	P3.1.5	D

3.1.1.3.1.6	Maintain Product Structure Revisions	ACMS shall increment the product structure revision indicator when the product structure is changed by adding, modifying, and deleting particular product structure element revisions, effectivities, or options such as alternative or substitute parts.	P3.1.10	D
3.1.1.3.1.7	Maintain Effectivity	ACMS shall provide the capability to create and maintain information on when a product structure element revision is valid for use in assembling a particular configuration of a product.	P3.1.6	D
3.1.1.3.1.8	Support Multiple Baseline Effectivities	ACMS shall support multiple baselines within a product structure and be able to specify the effectivity of the baseline using various methods to include by serial number, production date, matched sets, and lot.	P3.1.7	D
3.1.1.3.1.9	Identify Product Structure Element Options	ACMS shall provide the capability to identify product structure element options such as alternate or substitute parts.	P3.1.8	D
3.1.1.3.2	Viewing and Reporting Requirements.			
3.1.1.3.2.1	Provide Multiple Product Structure Views	ACMS shall provide the capability to create, display, and print various views of a product structure. Example views include a designer's view, a manufacturer's view, and a program manager's view.	P3.3.1	D
3.1.1.3.2.2	Provide Various Product Structure Reports	ACMS shall provide the capability to create, store, display, and print various product structure reports.	P3.3.2	D
3.1.1.4	Program Management Requirements.			
3.1.1.4.1	Maintain WBS and Relate Product Data to Tasks	ACMS shall provide the capability to create and maintain a project work breakdown structure (WBS) and allow users to relate ACMS controlled product data and product structures to the WBS tasks.	P4.1	D
3.1.1.4.2	Develop Schedule and Monitor Status	ACMS shall provide the ability to create schedules for WBS tasks and determine the status of tasks as well as the status of ACMS controlled product data and product structures associated with the tasks.	P4.2	D
3.1.1.4.3	Assign and Track Resources	ACMS shall provide the capability to assign resources to tasks and track the expenditure of those resources.	P4.3	D

3.1.1.5 Data Translation Requirements.

3.1.1.5.1	List Available Translators	ACMS shall provide a list of translators accessible via ACMS and the formats each translator accepts and creates.	P6.2.4	D
3.1.1.5.2	Add Translators	ACMS shall include the capability to add product data translators. When translation is necessary, ACMS will schedule and route the product data to appropriate translators, apply default settings for translations, initiate the translation, and route the output to the user.	P6.2.2	D
3.1.1.5.3	Provide Automatic Translation Services	ACMS shall provide the capability to automatically translate product data to pre-specified formats in response to event triggers or workflow prompts.	P6.2.1	D
3.1.1.5.4	Provide Default Translation Parameters	ACMS shall provide default translation parameters that may be modified by the user. Example parameters include product data destination, location, name, and format.	P6.2.3	D
3.1.1.5.5	Translate Product Data	ACMS shall provide the capability to schedule and route product data to appropriate product data translators, apply default settings for translations, initiate the translation, and route the output to the user.	P6.1.4	D

3.1.1.6 Imaging Services Requirements.

3.1.1.6.1	Create and Display Viewable Images	ACMS shall provide the capability to create and display viewable images using one or more of the following viewing software applications: TBD.	P7.1	D
3.1.1.6.2	Add Viewer Applications	ACMS shall support the integration of additional viewer applications beyond those originally specified.	P7.2	D
3.1.1.6.3	Support Viewable Image Review	ACMS shall provide the capability for multiple reviewers to red-line, mark-up, and provide annotations to viewable images.	P7.4	D
3.1.1.6.4	Maintain Distinct Red-Lines	ACMS shall ensure that individual reviewer red-lines and annotations are kept distinct.	P7.5	D
3.1.1.6.5	Print Viewable Images and Redlines	ACMS shall provide the capability to print viewable images and redlines.	P7.7	D

3.1.1.7 System Administration Requirements.

3.1.1.7.1 User Authorization and Management Requirements.

3.1.1.7.1.1	Establish User Information	ACMS shall provide the capability to establish and modify user information and access permissions.	P8.2.2	D
3.1.1.7.1.2	Enter Password	ACMS shall require the user to enter a password to access the system.	P8.2.4	D
3.1.1.7.1.3	Modify Password	ACMS shall provide the capability for the user to change a his or her password.	P8.2.5	D
3.1.1.7.1.4	Create and Modify Identities, Roles, and Groups	ACMS shall provide the capability to create and modify user identities, roles, and groups.	P8.2.7	D
3.1.1.7.1.5	Assign Permissions	ACMS shall provide the capability to assign access permissions to roles, groups, and users.	P8.2.7-1	D
3.1.1.7.1.6	Assign Roles to Groups	ACMS shall provide the capability to assign roles to groups.	P8.2.7-2	D
3.1.1.7.1.7	Assign Users to Roles within Groups	ACMS shall provide the capability to assign users to roles within groups.	P8.2.7-3	D
3.1.1.7.1.8	Tailor User's Role and Group Permissions	ACMS shall provide the capability tailor role and group permissions for a specific user.	P8.2.7-4	D
3.1.1.7.1.9	Associate Product Structures and Product Data to Groups	ACMS shall provide the capability to associate product structures and product data to groups.	P8.2.7-5	D
3.1.1.7.1.10	Limit Access	ACMS shall limit a user’s access to product structures and product data associated with a group based on the most restrictive access permissions specified for the user, the role assigned to the user, or the group to which the user and role are assigned.	P8.2.7-6	D

3.1.1.7.2	Distributed Data Environment Management Requirements.			
3.1.1.7.2.1	Manage Distributed Data Environment	ACMS shall provide the capability to maintain, coordinate, and synchronize a distributed data environment that includes multiple sites, multiple servers, multiple networks, multiple repositories, and multiple PDM systems.	P8.3	D
3.1.1.7.3	Archive, Backup, and Restore Management Requirements.			
3.1.1.7.3.1	Archive and Backup ACMS	ACMS shall provide the capability to create and maintain continuous transaction logs, backups, and archives.	P8.4.1	D
3.1.1.7.3.2	Restore ACMS	ACMS shall provide the capability to restore the system using transaction logs and backups in support of normal data protection operations and COOPs.	P8.4.2	D
3.1.1.7.3.3	Retrieve from Archives	ACMS shall provide the capability to request that data be retrieved from off-line archival storage to support Continuity of Operations Plans (COOPs).	P8.4.3	D
3.1.1.7.4	Tailoring Requirements.			
3.1.1.7.4.1	Create and Modify Metadata Defaults	ACMS shall provide the system administrator with the ability to create and modify metadata defaults.	P8.1	D
3.1.1.7.4.2	Customize User Interface	ACMS shall provide the system administrator with the capability to customize the user interface.	P8.6	D
3.1.1.7.4.3	Customize System Messages and Terminology	ACMS shall provide the system administrator with the capability to customize the system messages and terminology.	P8.7	D
3.1.1.7.4.4	Add New Functionality	ACMS shall provide the system administrator with the capability to add new ACMS functionality such as defining new metadata elements, associating them with product structures and product data, and defining queries and reports.	P8.9.1	D
3.1.1.7.4.5	Create Editable Displays	ACMS shall allow the system administrator to create editable displays for ACMS users. Examples include ECP evaluation, data check-in, and data release displays.	P8.9.2	D

3.1.1.7.5	System Security and Monitoring Requirements.			
3.1.1.7.5.1	Establish Security Controls	ACMS shall provide capabilities that enable the system administrator to establish security controls and monitor the system for security violations.	P8.10.1	D
3.1.1.7.5.2	Provide Virus Checking	ACMS shall provide controls to protect the system and data from contamination by unauthorized computer programs or data such as viruses.	P8.10.2	D
3.1.1.7.5.3	Apply File Name Encryption	ACMS shall encrypt the names of file with restricted access to preclude accessing these files directly through the operating system without using the ACMS interface.	P8.10.3	D
3.1.1.7.5.4	Record Unauthorized Access Attempts	ACMS shall record unauthorized attempts to access ACMS data and shall deny ACMS use to users whose unauthorized attempts have reached the specified maximum threshold.	P8.10.4	D
3.1.1.7.6	Performance Monitoring Requirements.			
3.1.1.7.6.1	Monitor System Performance and Usage	ACMS shall provide the system administrator the capability to monitor system performance and usage.	P8.11	D
3.1.1.7.6.2	Resolve Performance Degradation	ACMS shall provide mechanisms for resolving system performance degradation. Vendors are expected to propose mechanisms.	P1.3.5	D
3.1.2	*Configuration Management Requirements.*			
3.1.2.1	Configuration Management Data Exchange Requirements.			
3.1.2.1.1	Process Data Information Packets	ACMS shall provide the capability to accept, create, validate, store, retrieve, modify, and archive data information packets as defined in MIL-STD-2549, dated 30 June 1997 and the November 1997 Errata Sheet.	C0028	D

3.1.2.2	Configuration Planning Requirements.			
3.1.2.2.1	Manage Program Management Documents	ACMS shall provide the capability to identify, store, retrieve, and display Program Management documents in a vault. Program Management documents include Acquisition Strategy, Configuration Management Plans, Audit Plans, Interface Control Agreements and other documents associated with the management and control of weapon systems, end items, assemblies, and components for the purpose of CM activity support.	C0001	D
3.1.2.2.2	Determine Contract Data Requirements	ACMS shall provide the capability to determine, record, and display the types of MIL-STD-2549 data information packets required as contract deliverables.	C0002	D
3.1.2.2.3	Record CM Activity Management Data	For each CM activity (see Appendix D), ACMS shall record CM activity data which may include the following: participants, reviewers, responsible activity name, location, Point of Contact, decision authority, phone numbers, action items, milestones, and related dates (e.g., decision date, audit date, and review suspense dates).	C0004	D
3.1.2.2.4	Generate CM Performance Statistics	ACMS shall generate performance statistics for on-line display and in reports on CM activities (see Appendix D), for the purpose of continuous improvement. Performance statistics will provide data that identifies any backlog, bottleneck and errors.	C0005	D
3.1.2.3	Configuration Identification Requirements.			
3.1.2.3.1	Establish Configuration Items and Their Identifiers	ACMS shall provide the capability to assign, record, and display CI identifiers at each level within the product structure.	C0006	D
3.1.2.3.2	Record Metadata and Assign Unique Identifiers	ACMS shall provide the capability to assign, record, and display metadata and unique identifiers for product structure elements and documents.	C0007	D
3.1.2.3.3	Create Metadata Elements	ACMS shall provide the capability to create, update, and delete metadata elements associated with product structure elements and documents.	C0008	D

3.1.2.3.4	Create Relationships	ACMS shall provide the capability to create relationships between and record metadata about the relationship for items such as CIs, product structure elements and documents to include change and audit actions. For example, CI to CI and CI to part.	C0015	D
3.1.2.3.5	Identify Revisions	ACMS shall provide the capability to identify, record, and display the current and all previous document revision identifiers.	C0019	D
3.1.2.4	Configuration Audit Requirements.			
3.1.2.4.1	Record Configuration Audit Activities	ACMS shall support functional, physical, and incremental configuration audits by providing document support (see Appendix D); recording pre-audit schedule, agenda, rules, participation, comments, audit dates, facilities, and assignment of audit actions; tracking the status and results of audit actions; and recording the history of all audit activity.	C0020	D
3.1.2.4.2	Create Relationships	ACMS shall provide the capability to create relationships between audit actions and its related product structure element or document.	C0021	D
3.1.2.5	Configuration Control Requirements.			
3.1.2.5.1	Store Baselines	ACMS shall provide the capability to store, retrieve, and display configuration baselines (functional baseline, allocated baseline, product baseline, technical baselines, and incremental baselines).	C0022	D
3.1.2.5.2	Perform Baseline Compare	ACMS shall provide the capability to compare multiple views (e.g., CIs, parts, and documents) of baselined documents and identify differences both on-line and in reports.	C0035	D
3.1.2.5.3	Record and Review Change Actions	ACMS shall provide the capability to identify, record, retrieve, and display the disposition of proposed change actions, amended or revised proposed change actions, and variances to the configuration documentation and hardware or software configuration.	C0024	D
3.1.2.5.4	Review Change History	ACMS shall provide the capability to retrieve and display the history of change actions for a particular product structure element and document.	C0025	D

3.1.2.5.5	Provide CCB Information	ACMS shall record, retrieve, and display Configuration Control Board (CCB) information such as membership; members of interfacing activities; all change proposals, their originators, their disposition and the date of disposition; CCB Directives; and descriptions of any action items.	C0026	D
3.1.2.6	Status Accounting Requirements.			
3.1.2.6.1	Record Field Configuration	ACMS shall provide the capability to record, retrieve, and display "as built" and "as modified" configurations resulting from the installation and removal of assemblies, components, parts, and material whether, serialized or track by lot or batch.	C0031	D
3.1.2.6.2	Provide Reports	ACMS shall provide reports essential for performing engineering/logistics analysis, configuration baselines, performing comparison analysis, and status of the system configuration throughout the life cycle.	C0033	D
3.1.3	*Tech Loop Requirements.*			
3.1.3.1	Record Tech Loop Activity	ACMS shall provide the capability to record tech loop activities including technical reviewers and electronic authorizations, responsible activity, milestones, action items, and related dates, allowing for multiple parallel processing.	T0001	D
3.1.3.2	Establish TL Identifiers	ACMS shall provide the capability to assign, record, and display metadata and unique identifiers for each action routed through the tech loop review (e.g. PRON, top part number, type of procurement, weapon system, first article requirements, serialization requirements, comments, procurement source information, documentation availability/status as it relates to procurement actions, and the AMC/AMSC code, as well as other required attributes from Procurement Work Directive (PWD)).	T0002	D
3.1.3.3	Record Procurement History Data	ACMS shall provide the capability to record, retrieve, reuse, and display the current and all previous tech loop actions.	T0003	D
3.1.3.4	Establish Relationships	ACMS shall provide the capability to establish relationships and identify metadata about those relationships between tech loop actions and configuration management data.	T0004	D

3.1.3.5	Generate Reports	ACMS shall provide the reports essential for performing tech loop reviews including the capability for procurement specific suppressions/omissions.	T0005	D
3.1.3.6	Compare Baselines	ACMS shall provide the capability to compare baselines established as part of a tech loop review and identify differences (see Configuration Control Requirements “Store Baselines” and “Perform Baseline Compare”).	T0007	D
3.1.3.7	Support DFARS Appendix E Screening	ACMS shall provide an automated DFARS Appendix E screening questionnaire to be used during the tech loop review.	T0008	D
3.1.3.8	Support Hazmat Screening	ACMS shall provide the capability to assign, record, and display metadata and unique identifiers in support of the hazardous material screening during tech loop review (e.g. electronic bulletin board, status forms, internal messaging, alternate solutions).	T0009	D
3.1.3.9	Establish Hazmat Relationships	ACMS shall provide the capability to establish relationships between hazardous material data and configuration management data.	T0010	D
3.1.3.10	Attach Documents to Actions	ACMS shall provide the ability to attach documents to tech loop actions.	New VENUS 1	D
3.1.3.11	Identify and Link Similar Procurement Actions	ACMS shall have the ability to identify and automatically link current procurement requests that have the same part number and GFE/GFM suppressions.	New ARDEC 4	D
3.1.3.12	Bundle Procurement Requests	ACMS shall have the ability to search, group and process as a single procurement action, procurement requests, based on user defined attributes.	New VENUS 2	D

3.2 Interface Requirements.

This section presents the following types of interface requirements:

- ❑ External interface requirements specify external items with which ACMS must interact.
- ❑ Internal interface requirements define the interconnection of functions or functional areas within the system.
- ❑ User interface requirements specify or constrain content, formats, timing, and other factors associated with the interaction between ACMS and the user.

3.2.1 External Interface Requirements.

3.2.1.1	Process Data Information Packets	For requirements pertaining to exchanging MIL-STD-2549 Data Information Packets, see Section 3.1.2.1.	P-C0028	D
3.2.1.2	Send E-Mail	ACMS shall provide the capability to send system (including automatic generation of event triggered messages) and user electronic messages to multiple recipients who are either internal or external to the system using SMTP for the external interfaces.	P5.1	D

3.2.1.3	Provide Generic API	ACMS shall provide a generic API that allows external applications to invoke selected ACMS functions to include retrieving product data. Examples of external applications that might invoke ACMS functions include: ❑ AutoCAD, ❑ CADDS 5, ❑ CADAM, ❑ CATIA, ❑ UG, ❑ HPME30, ❑ Pro/Engineer, ❑ I-DEAS, ❑ CADENCE, ❑ Interleaf, ❑ MS Word, ❑ WordPerfect, ❑ Microstation, ❑ Excel, ❑ OrCad, ❑ CAM 350, ❑ Anvil, ❑ Mentor, ❑ EMS, ❑ MS Project, and ❑ MS Power Point. (This requirement should be tailored by the implementing command at the time of acquisition.)	P6.1.2	I
3.2.1.4	Interface with External Systems	ACMS shall provide the capability to exchange product data with JEDMICS and other repositories, PDM systems, configuration management systems, and CITIS systems to include the following: TBD.	P6.1.5	D

3.2.1.5	Launch Applications	ACMS shall provide the capability to incorporate triggers that result in launching user applications based on events, user actions, or times. Applications that might launched from ACMS include the following: ❑ AutoCAD, ❑ CADDS 5, ❑ CADAM, ❑ CATIA, ❑ UG, ❑ HPME30, ❑ Pro/Engineer, ❑ I-DEAS, ❑ CADENCE, ❑ Interleaf, ❑ MS Word, ❑ WordPerfect, ❑ Microstation, ❑ Excel, ❑ OrCad, ❑ CAM 350, ❑ Anvil, ❑ Mentor, ❑ EMS, ❑ MS Project, and ❑ MS Power Point. (This requirement should be tailored by the implementing command at the time of acquisition.)	P8.8.1	D
3.2.1.6	Share Metadata	ACMS shall provide the capability to share ACMS controlled metadata with other systems.	P8.8.3	D
3.2.1.7	Interface with Oracle-Based Repositories	ACMS shall be capable of interfacing with repositories running Oracle.	D0018	D
3.2.1.8	Interface with MEARS	ACMS shall be capable of dynamic interface with MEARS to exchange engineering change actions and associated metadata.	D0020	D

3.2.1.9	Interface with ECALS	ACMS shall be capable of dynamic interface with ECALS to exchange engineering change actions and associated metadata.	D0020-1	D
3.2.1.10	Interface with CARS	ACMS shall be capable of dynamic interface with CARS to exchange engineering change actions and associated metadata.	D0020-2	D
3.2.1.11	Interface with PC-JEDMICS	ACMS shall be capable of dynamic interface with PC-JEDMICS.	D0021	D
3.2.1.12	Interface with CCSS 404	ACMS shall be capable of batch loading data from the CCSS 404 application.	D0021-NEW1	D
3.2.1.13	Interface with CCSS for DFARS Appendix E	ACMS shall be capable of batch loading data from CCSS for DFARS Appendix E Screening Questionnaire.	D0021-NEW2	D
3.2.1.14	Interface with CCSS for Sector 2800	ACMS shall be capable of batch loading data to/from CCSS for Sector 2800.	D0021-NEW3	D
3.2.1.15	Interface with CCSS for Competition Management	ACMS shall be capable of batch loading data from CCSS for Competition Management.	D0021-NEW4	D
3.2.1.16	Interface with Flight Safety	ACMS shall be capable of batch loading data from Flight Safety.	D0021-NEW5	D
3.2.1.17	Interface with Information Handling Services (IHS)	ACMS shall be capable of batch loading metadata from Information Handling Services (IHS).	D0021-NEW6	D
3.2.1.18	Interface with JCALS Workflow Manager	ACMS shall be capable of a dynamic interface with JCALS Workflow Manager.	D0021-NEW7	D
3.2.1.19	Interface with JEDMICS	ACMS shall be capable of dynamic interface with JEDMICS.	D0021-NEW8	D
3.2.1.20	Interface with Field and Depot Maintenance Systems	ACMS shall be capable of interfacing/batch loading field and depot maintenance data systems/data. An example is the Aviation Maintenance Data Management System.	D0021-NEW9	D

3.2.2	*Internal Interface Requirements.*	No internal interface requirements have been specified for the ACMS. All internal interfaces are left to the design or to requirement specifications for ACMS components.		
3.2.3	*User Interface Requirements.*			
3.2.3.1	Provide On-Line Help	The ACMS user interface shall provide context sensitive, on-line help to users	P10.1	D
3.2.3.2	Provide Help Search	The ACMS user interface shall provide interactive help to users, via searching on key words.	P10.2	D
3.2.3.3	Provide On-Line Documentation	The ACMS user interface shall provide users the ability to view system documentation on-line.	P10.3	D
3.2.3.4	Provide Context-Sensitive, Indexed, and Searchable Help	ACMS shall include automated HELP mechanisms that are context-sensitive, indexed, and searchable.	D0015	D
3.2.3.5	Include Help Table of Contents, Examples, and Demos	ACMS HELP shall include a Table of Contents, Examples, Demonstrations, and on-line user and administrator manuals.	D0016	D
3.2.3.6	Provide Graphical User Interface	The predominate ACMS user interface shall be a graphical user interface.	P11.1	D
3.2.3.7	Provide Web-Browser Interface	ACMS shall provide a web-browser user interface with full functionality.	P12.1	D
3.3	***Ownership and Support Requirements.***	This section specifies user skill requirements, system training requirements, system maintenance requirements, and system performance requirements.		
3.3.1	Support User with Basic PC and ACMS Skills	ACMS will be operated by users who have basic PC skills, including familiarity with their target operating systems such as Windows or UNIX, and have attended ACMS training. Users will be expected to have skills consistent with the role to which they are assigned. For example, a Configuration Management Specialist will be knowledgeable in Configuration Management theory.	D0011	D
3.3.2	Support Competent Administrators	ACMS will be administered by users who have competency in their target operating systems, database administration, and performance tuning.	D0012	D

3.3.3	Require Minimal Basic Training	Training of a basic ACMS user shall require no more than three work days. The basic user will be able to sign on to the system, navigate product structures, locate and retrieve data, and execute tasks received from a workflow.	D0013	D
3.3.4	Require Minimal Administrative Training	Training in administration of ACMS shall require no more than 10 work days. This training shall encompass all functionality available to administrative users.	D0014	D
3.3.5	Require Minimal Downtime	ACMS shall require no more than 4 hours a week of scheduled administrative downtime for routine maintenance and backup activities.	D0017	T
3.3.6	Require Minimal Restoration Time	ACMS restorations from backups shall take no longer than TBD hours given a database of TBD records.	D0026	T
3.3.7	Meet Performance Goals	ACMS shall demonstrate the following performance characteristics on stored data that is isolated from the organization's general purpose wide area network: ❑ Product Structure Navigation - 1 second, ❑ Internally retrieve/view simple documents - 5 seconds, ❑ Internally retrieve/view raster dwgs - 5 seconds, ❑ Internally retrieve/view engineering models - 5 seconds, ❑ Change data object attributes - 1 second, ❑ System Navigation - 1 second, ❑ Simple Queries - 1 second, and ❑ Complex Queries - 5 seconds.	D0024	T
3.3.8	Refresh Distributed Data	ACMS shall provide the capability to refresh distributed data records based on system administrator-specified frequencies, but not less than on a daily basis.	D0025	D
3.3.9	Be Year 2000 Compliant	ACMS shall be Year 2000 compliant.	C0036	T

3.4	***Operating Environment Requirements.***	This section specifies requirements constraining the environment under which the ACMS will be expected to operate. The environmental constraints are organized into the following subsections: Client Workstation Requirements, Network Requirements, and Server Requirements.		
3.4.1	*Client Workstation Requirements.*			
3.4.1.1	Support Client Workstation: Platform Type	ACMS shall be capable of providing client functionality and performance as described in this specification on the following platforms: ❑ IBM compatible PCs running MS Windows 3.x, 95, and NT operating systems; ❑ Silicon Graphics workstations running UNIX/IRIX; ❑ Sun workstations running Solaris; ❑ HP/Apollo workstations running HP-UX; ❑ Macintosh; ❑ Intergraph workstations running CLIX; and ❑ X-Terminals running under IRIX/UNIX/Solaris operating systems.	D0001	D
3.4.1.2	Support Client Workstation: Minimum Memory	ACMS shall be capable of providing client functionality and performance as described in this specification on platforms with at least 100 MBytes of disk storage and at least 32 MBytes of RAM.	D0002	D
3.4.1.3	Support Client Workstation: Minimum Processor Speed	ACMS shall be capable of providing client functionality and performance as described in this specification on platforms with processor speeds of at least 90 MHz.	D0003	D
3.4.2	*Network Requirements.*			
3.4.2.1	Support Network Protocols	ACMS shall be capable of operating in a client-server Ethernet networked environment using TCP/IP, NFS, or IPX/SPX.	D0004	D
3.4.2.2	Support Network Operating Systems	ACMS shall be capable of operating in a client-server Windows NT, Banyan Vines, or Novell networked environment.	D0005	D
3.4.2.3	Support Maximum Number of Users	ACMS shall be capable of supporting up to 4,000 users total and up to 500 users simultaneously at any one implementation.	D0006	A

3.4.3 Server Requirements.

3.4.3.1	Support Server: Platforms Types	ACMS server software shall be capable of operating on the following platforms: ❑ Sun workstations running UNIX; ❑ Silicon Graphics workstations running UNIX; ❑ IBM Compatible Pentium PCs running Windows NT Server; and ❑ Hewlett Packard HP9000/800 K Series running HP-UX.	D0007	D
3.4.3.2	Support Server: Minimum Disk Space	ACMS server software shall be capable of operating on platforms with disk storage of at least 35 GBytes, excluding data file storage requirements.	D0008	D
3.4.3.3	Support Server: Minimum RAM	ACMS server software shall be capable of operating on platforms with RAM of at least 2.1 GBytes.	D0009	D
3.4.3.4	Support Server: Minimum Processor Speed	ACMS server software shall be capable of operating on platforms with aggregate processing speeds of at least 800 MHz.	D0010	D

4. VERIFICATION

This section specifies the types of verifications to be performed to determine that ACMS conforms to the Section 3 requirements. This section does not include quality requirements that belong in the contract, such as responsibility for inspection, establishment of quality program requirements, warranties, instructions for nonconforming items, and contractor liability for nonconformance.

4.1 Verification Methods.

Each requirement will be verified. Methods used to verify ACMS requirements will include demonstration, inspection, analysis, and test as described below. All data resulting from these verifications will be made available to the Government for review upon request.

ACMS verification methods include:

- *Demonstration (D)*. Verification by demonstration involves confirming requirement satisfaction by operating the system, or a part of the system, observing the system's operation, and recording the success or failure of the system's operation. Demonstration relies on observable functional operation and does not require use of instrumentation, special test equipment, or subsequent analysis. Demonstration includes testing an item under a specific set of conditions without recording quantitative data.
- *Inspection (I)*. Verification by inspection involves visual examination of system components and review of documentation.
    - ACMS inspections via visual examinations are observations to determine if a required function or interface exists, an environmental constraint was met, or an ownership or support requirement was satisfied. These visual examinations do not involve evaluation or measurement of the correctness, accuracy, or precision.
    - ACMS inspections via document review include examination of descriptive documents to ensure what is described is what is required. Descriptive documents can include, but are not limited to, requirements documents, design documents, analysis documents, concept of operation and scenario documents, and graphical, management, and analysis outputs from Computer Assisted Software Engineering (CASE) tools. Review of documentation can include examination of system outputs to determine if the content conforms to what is required. Document review also can include structured walkthroughs for custom software components of the system.
- *Analysis (A)*. Verification by analysis is accomplished by processing accumulated data obtained from other verification methods. Analysis includes conclusions drawn from test data, modeling based on system design and performance, and the extension of test-produced data to untested conditions.
- *Test (T)*. Verification by test involves confirming that a requirement is met by measuring, recording, and evaluating qualitative and quantitative data obtained during controlled operation of the system. Data may be gathered using instrumentation or other special test equipment, and evaluated as to its correctness, accuracy, or precision.

4.2 Verification Requirements.

Table 4-1 indicates the verification method to be used for each ACMS requirement.

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.1.1.1.1.1	Provide Secure Data Storage	P1.1	D
3.1.1.1.1.2	Store Product Data	P1.2.1	D
3.1.1.1.1.3	Store CM-Controlled Product Data	P1.2.3	D
3.1.1.1.2.1	Check Identify and Authorizations	P1.3.1	D
3.1.1.1.2.2	Suppress Unauthorized Functions	P1.3.2	D
3.1.1.1.2.3	Provide User Feedback	P1.3.3	D
3.1.1.1.2.4	Provide Rule-Based Access Control	P1.3.4	I
3.1.1.1.2.5	Provide Check-In Capability	P1.3.6.1	D
3.1.1.1.2.6	Partition Vaults	P1.3.6.2	D
3.1.1.1.2.7	Accept Default Destination	P1.3.6.3	D
3.1.1.1.2.8	Permit Path Override	P1.3.6.4	D
3.1.1.1.2.9	Lock Checked Out Product Data	P1.3.7.2	D
3.1.1.1.2.10	Permit Copying Checked-Out Product Data	P1.3.7.3	D
3.1.1.1.2.11	Identify Who Is Using	P1.3.7.5	D
3.1.1.1.2.12	Provide Location-Independent Check-Out	P1.3.7.6	D
3.1.1.1.2.13	Specify Check-Out Location	P1.3.7.6.b	D
3.1.1.1.2.14	Cancel Check-Out	P1.3.7.7	D
3.1.1.1.3.1	Provide for Metadata Maintenance	P1.4.1	D
3.1.1.1.3.2	Track Metadata Status and Changes	P1.4.2	D
3.1.1.1.4.1	Search and Navigate Product Structures	P1.5.2.1	D
3.1.1.1.4.2	Search and Navigate Product Structure	P1.5.4	D
3.1.1.1.4.3	Provide Enterprise-Wide Navigation	P3.2.0.1	D
3.1.1.1.4.4	Provide Enterprise-Wide Product Data Location	P3.2.0.2	D
3.1.1.1.4.5	Provide Enterprise-Wide Product Data Retrieval	P3.2.0.3	D

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.1.1.1.4.6	Locate Where-Used	P3.2.2	D
3.1.1.1.4.7	Determine Product Structure Elements Used	P3.2.3	D
3.1.1.1.4.8	Relate Product Data	P1.5.3.1	D
3.1.1.1.4.9	Define Valid Relationship Types	P1.5.3.2	D
3.1.1.1.4.10	Relate Product Structure Elements and Product Data	P1.5.3.3	D
3.1.1.1.4.11	Define Valid Relationship Rules	P1.5.3.4	D
3.1.1.1.4.12	Create Groupings	P1.5.1.1	D
3.1.1.1.4.13	Arrange Groupings	P1.5.1.2	D
3.1.1.1.4.14	Query Metadata	P1.5.2.2	D
3.1.1.1.4.15	Support Queries	P1.5.2.3	D
3.1.1.1.4.16	Support Various Query Methods	P1.5.2.4	D
3.1.1.1.4.17	Retrieve Based on Query Results	P1.5.2.5	D
3.1.1.1.4.18	Track Revision Compatibility	P1.5.3.5	D
3.1.1.1.5.1	Support Electronic Approvals	P1.6	D
3.1.1.1.5.2	Track Revision and Release Status	P1.7	D
3.1.1.1.6.1	Record Audit History	P1.8.1	D
3.1.1.1.6.2	View Audit History	P1.8.2	D
3.1.1.1.6.3	Record Product Data Transport Transactions	P6.1.6	D
3.1.1.2.1.1	Create and Save Workflow Templates	P2.1.1	D
3.1.1.2.1.2	Create Ad Hoc Workflows	P2.1.2	D
3.1.1.2.1.3	Support Workflow Steps, Timing, and Dependencies	P2.1.3	D
3.1.1.2.1.4	Specify Workflow Rules	P2.1.4	D
3.1.1.2.1.5	Create Action Triggers	P2.1.5	D
3.1.1.2.1.6	Associate Product Data	P2.1.8	D

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.1.1.2.2.1	Monitor Workflow	P2.1.11	D
3.1.1.2.2.2	Highlight Late Tasks	P2.1.12	D
3.1.1.2.2.3	Record Workflow History	P2.1.13	D
3.1.1.2.2.4	Check Work Queues	P2.1.14	D
3.1.1.2.2.5	Generate Event Notifications	P2.1.6	D
3.1.1.2.2.6	Edit Workflow	P2.1.7	D
3.1.1.2.2.7	Route Product Data via Workflow	P2.2	D
3.1.1.2.2.8	Provide Event-Based Triggers	P2.3	D
3.1.1.2.2.9	Distribute Product Data and Notifications	P2.4	D
3.1.1.2.2.10	Provide Electronic Sign-off	P2.5.1	D
3.1.1.2.2.11	Record Votes	P2.5.2	D
3.1.1.3.1.1	Create and Associate Product Structure Elements	P3.1.1	D
3.1.1.3.1.2	Maintain Product Structure	P3.1.9	D
3.1.1.3.1.3	Represent Product Structure Hierarchically	P3.1.2	D
3.1.1.3.1.4	Maintain Product Structure Element Revisions	P3.1.4	D
3.1.1.3.1.5	Accommodate Multiple Revisions	P3.1.5	D
3.1.1.3.1.6	Maintain Product Structure Revisions	P3.1.10	D
3.1.1.3.1.7	Maintain Effectivity	P3.1.6	D
3.1.1.3.1.8	Support Multiple Baseline Effectivities	P3.1.7	D
3.1.1.3.1.9	Identify Product Structure Element Options	P3.1.8	D
3.1.1.3.2.1	Provide Multiple Product Structure Views	P3.3.1	D
3.1.1.3.2.2	Provide Various Product Structure Reports	P3.3.2	D
3.1.1.4.1	Maintain WBS and Relate Product Data to Tasks	P4.1	D
3.1.1.4.2	Develop Schedule and Monitor Status	P4.2	D
3.1.1.4.3	Assign and Track Resources	P4.3	D
3.1.1.5.1	List Available Translators	P6.2.4	D

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.1.1.5.2	Add Translators	P6.2.2	D
3.1.1.5.3	Provide Automatic Translation Services	P6.2.1	D
3.1.1.5.4	Provide Default Translation Parameters	P6.2.3	D
3.1.1.5.5	Translate Product Data	P6.1.4	D
3.1.1.6.1	Create and Display Viewable Images	P7.1	D
3.1.1.6.2	Add Viewer Applications	P7.2	D
3.1.1.6.3	Support Viewable Image Review	P7.4	D
3.1.1.6.4	Maintain Distinct Red-Lines	P7.5	D
3.1.1.6.5	Print Viewable Images and Redlines	P7.7	D
3.1.1.7.1.1	Establish User Information	P8.2.2	D
3.1.1.7.1.2	Enter Password	P8.2.4	D
3.1.1.7.1.3	Modify Password	P8.2.5	D
3.1.1.7.1.4	Create and Modify Identities, Roles, and Groups	P8.2.7	D
3.1.1.7.1.5	Assign Permissions	P8.2.7-1	D
3.1.1.7.1.6	Assign Roles to Groups	P8.2.7-2	D
3.1.1.7.1.7	Assign Users to Roles within Groups	P8.2.7-3	D
3.1.1.7.1.8	Tailor User's Role and Group Permissions	P8.2.7-4	D
3.1.1.7.1.9	Associate Product Structures and Product Data to Groups	P8.2.7-5	D
3.1.1.7.1.10	Limit Access	P8.2.7-6	D
3.1.1.7.2.1	Manage Distributed Data Environment	P8.3	D
3.1.1.7.3.1	Archive and Backup ACMS	P8.4.1	D
3.1.1.7.3.2	Restore ACMS	P8.4.2	D
3.1.1.7.3.3	Retrieve from Archives	P8.4.3	D
3.1.1.7.4.1	Create and Modify Metadata Defaults	P8.1	D
3.1.1.7.4.2	Customize User Interface	P8.6	D

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.1.1.7.4.3	Customize System Messages and Terminology	P8.7	D
3.1.1.7.4.4	Add New Functionality	P8.9.1	D
3.1.1.7.4.5	Create Editable Displays	P8.9.2	D
3.1.1.7.5.1	Establish Security Controls	P8.10.1	D
3.1.1.7.5.2	Provide Virus Checking	P8.10.2	D
3.1.1.7.5.3	Apply File Name Encryption	P8.10.3	D
3.1.1.7.5.4	Record Unauthorized Access Attempts	P8.10.4	D
3.1.1.7.6.1	Monitor System Performance and Usage	P8.11	D
3.1.1.7.6.2	Resolve Performance Degradation	P1.3.5	D
3.1.2.1.1	Process Data Information Packets	C0028	D
3.1.2.2.1	Manage Program Management Documents	C0001	D
3.1.2.2.2	Determine Contract Data Requirements	C0002	D
3.1.2.2.3	Record CM Activity Management Data	C0004	D
3.1.2.2.4	Generate CM Performance Statistics	C0005	D
3.1.2.3.1	Establish Configuration Items and Their Identifiers	C0006	D
3.1.2.3.2	Record Metadata and Assign Unique Identifiers	C0007	D
3.1.2.3.3	Create Metadata Elements	C0008	D
3.1.2.3.4	Create Relationships	C0015	D
3.1.2.3.5	Identify Revisions	C0019	D
3.1.2.4.1	Record Configuration Audit Activities	C0020	D
3.1.2.4.2	Create Relationships	C0021	D
3.1.2.5.1	Store Baselines	C0022	D
3.1.2.5.2	Perform Baseline Compare	C0035	D
3.1.2.5.3	Record and Review Change Actions	C0024	D
3.1.2.5.4	Review Change History	C0025	D
3.1.2.5.5	Provide CCB Information	C0026	D

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.1.2.6.1	Record Field Configuration	C0031	D
3.1.2.6.2	Provide Reports	C0033	D
3.1.3.1	Record Tech Loop Activity	T0001	D
3.1.3.2	Establish TL Identifiers	T0002	D
3.1.3.3	Record Procurement History Data	T0003	D
3.1.3.4	Establish Relationships	T0004	D
3.1.3.5	Generate Reports	T0005	D
3.1.3.6	Compare Baselines	T0007	D
3.1.3.7	Support DFARS Appendix E Screening	T0008	D
3.1.3.8	Support Hazmat Screening	T0009	D
3.1.3.9	Establish Hazmat Relationships	T0010	D
3.1.3.10	Attach Documents to Actions	New VENUS 1	D
3.1.3.11	Identify and Link Similar Procurement Actions	New ARDEC 4	D
3.1.3.12	Bundle Procurement Requests	New VENUS 2	D
3.2.1.1	Process Data Information Packets	P-C0028	D
3.2.1.2	Send E-Mail	P5.1	D
3.2.1.3	Provide Generic API	P6.1.2	I
3.2.1.4	Interface with External Systems	P6.1.5	D
3.2.1.5	Launch Applications	P8.8.1	D
3.2.1.6	Share Metadata	P8.8.3	D
3.2.1.7	Interface with Oracle-Based Repositories	D0018	D
3.2.1.8	Interface with MEARS	D0020	D
3.2.1.9	Interface with ECALS	D0020-1	D
3.2.1.10	Interface with CARS	D0020-2	D

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.2.1.11	Interface with PC-JEDMICS	D0021	D
3.2.1.12	Interface with CCSS 404	D0021-NEW1	D
3.2.1.13	Interface with CCSS for DFARS Appendix E	D0021-NEW2	D
3.2.1.14	Interface with CCSS for Sector 2800	D0021-NEW3	D
3.2.1.15	Interface with CCSS for Competition Management	D0021-NEW4	D
3.2.1.16	Interface with Flight Safety	D0021-NEW5	D
3.2.1.17	Interface with Information Handling Services (IHS)	D0021-NEW6	D
3.2.1.18	Interface with JCALS Workflow Manager	D0021-NEW7	D
3.2.1.19	Interface with JEDMICS	D0021-NEW8	D
3.2.1.20	Interface with Field and Depot Maintenance Systems	D0021-NEW9	D
3.2.3.1	Provide On-Line Help	P10.1	D
3.2.3.2	Provide Help Search	P10.2	D
3.2.3.3	Provide On-Line Documentation	P10.3	D
3.2.3.4	Provide Context-Sensitive, Indexed, and Searchable Help	D0015	D
3.2.3.5	Include Help Table of Contents, Examples, and Demos	D0016	D
3.2.3.6	Provide Graphical User Interface	P11.1	D
3.2.3.7	Provide Web-Browser Interface	P12.1	D
3.3.1	Support User with Basic PC and ACMS Skills	D0011	D
3.3.2	Support Competent Administrators	D0012	D
3.3.3	Require Minimal Basic Training	D0013	D
3.3.4	Require Minimal Administrative Training	D0014	D
3.3.5	Require Minimal Downtime	D0017	T
3.3.6	Require Minimal Restoration Time	D0026	T
3.3.7	Meet Performance Goals	D0024	T

Table 4-1. ACMS Verification Requirements.

Paragraph Number	Requirement Title	Reference Number	Verification Method
3.3.8	Refresh Distributed Data	D0025	D
3.3.9	Be Year 2000 Compliant	C0036	T
3.4.1.1	Support Client Workstation: Platform Type	D0001	D
3.4.1.2	Support Client Workstation: Minimum Memory	D0002	D
3.4.1.3	Support Client Workstation: Minimum Processor Speed	D0003	D
3.4.2.1	Support Network Protocols	D0004	D
3.4.2.2	Support Network Operating Systems	D0005	D
3.4.2.3	Support Maximum Number of Users	D0006	A
3.4.3.1	Support Server: Platforms Types	D0007	D
3.4.3.2	Support Server: Minimum Disk Space	D0008	D
3.4.3.3	Support Server: Minimum RAM	D0009	D
3.4.3.4	Support Server: Minimum Processor Speed	D0010	D

5. PACKAGING

5.1 Packaging.

For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.

6.1 Intended Use.

Appendix A, ACMS Concept Overview, provides information relative to the nature and roles of the ACMS. Appendix B, ACMS Support of Weapon Systems and Data Life Cycles, and Appendix C, ACMS Support to Selected Business Processes, provide information relative to the use of the ACMS.

6.2 Acquisition Requirements.

6.2.1 Acquisition Document Requirements.

Acquisition documents must specify the following:

a. Title, number, and date of the specification.

b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2 and 2.3).

c. Packaging requirements (see 5.1).

d. Statements requiring that current technologies provide the basis for the initial ACMS implementation, that the vendor presents a strategy for integrating new and improved technologies, and that the vendor plans for technology refresh in future ACMS releases.

6.2.2 Long-Term Requirements.

Table 6-1 lists the ACMS requirements considered to be long-term requirements. These requirements may be deferred in the initial local ACMS implementations. However, it is expected that these requirements will be satisfied by the year 2002 in order to meet Army digitization goals.

6.3 Definitions.

Appendix D, Glossary, contains an alphabetical listing of the acronyms and terms used in this specification.

6.4 Subject Term (Key Word) Listing.

Subject terms (key words) which identify the principal subjects covered in this performance specification and which would allow identification of this performance specification during retrieval searches include the following:

- ❑ Configuration Management
- ❑ Engineering Data Management
- ❑ Product Data Management
- ❑ Tech Loop
- ❑ Workflow Management

6.5 Changes From Previous Issue.

The margins of this specification are marked with asterisks (or vertical lines) to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Table 6-1. Long-Term ACMS Requirements.

Paragraph Number	Requirement Title	Reference Number
3.1.1.1.4.3	Provide Enterprise-Wide Navigation	P3.2.0.1
3.1.1.1.4.4	Provide Enterprise-Wide Product Data Location	P3.2.0.2
3.1.1.1.4.5	Provide Enterprise-Wide Product Data Retrieval	P3.2.0.3
3.1.1.2.2.1	Monitor Workflow	P2.1.11
3.1.1.5.2	Add Translators	P6.2.2
3.1.1.5.3	Provide Automatic Translation Services	P6.2.1
3.1.1.5.4	Provide Default Translation Parameters	P6.2.3
3.1.1.5.5	Translate Product Data	P6.1.4
3.1.2.1.1	Process Data Information Packets	C0028
3.2.1.1	Process Data Information Packets	P-C0028
3.2.1.18	Interface with JCALS Workflow Manager	D0021-NEW7

CONCLUDING MATERIAL

Custodians:

Army - TBD

Preparing activity:

Army - TBD

(Project Number TBD)

Review activities:

Army - TBD

Navy - N/A

Air Force - N/A

DLA - N/A

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced documents(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	**1. DOCUMENT NUMBER**	**2. DOCUMENT DATE *(YYMMDD)***

3. DOCUMENT TITLE

Automated Configuration Management System (ACMS) Performance Specification

4. NATURE OF CHANGE (*Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	**b. ORGANIZATION**	
c. ADDRESS (*Include Zip Code)*	**d. TELEPHONE (*Include Area Code)*** **(1) Commercial** **(2) AUTOVON** **(*if applicable)***	**7. DATE SUBMITTED** **(*YYMMDD)***

8. PREPARING ACTIVITY

a. NAME	**b. TELEPHONE (*Include Area Code)*** **(1) Commercial** **(2) AUTOVON**
c. ADDRESS (*Include Zip Code)*	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340

APPENDICES

APPENDIX A. ACMS Concept Overview.

A.1 ACMS as a System of Systems.

This section describes the Army's long-term vision for ACMS. Near-term implementations within individual commands will be tailored to meet local needs and to reflect the state of the industry at the time of implementation.

A.1.1 Federated System of Systems.

ACMS will be the principal Army system for finding, retrieving, managing, and controlling access to Army product data. ACMS will be a federated system of systems. It will be federated in the sense that local sites will manage their own data and support their own site-unique business processes. It is a system of systems in the sense that all sites will share standard metadata (see Appendix D) that describe the managed product data and will possess capabilities that are common to the whole of ACMS. Within the ACMS federation, any authorized user will have visibility into controlled product structures, associated product data, and standard metadata.

A.1.2 Enterprise-Level Visibility.

ACMS will be fielded into an environment where many data management, repository, and workflow systems already exist. Additionally, ACMS will be fielded as local implementations within the ACMS federation. As such, the ACMS concept must embrace all of these related systems by interfacing with them, subsuming them, or replacing them. In some cases, ACMS will be the only system providing configuration management, product data management, product structure management, process management, or data storage for a set of product data. In other cases, actual storage and direct control of the data and product structure will be performed by a data management system which is external to the ACMS federation. ACMS must interface with these external data management systems to share metadata. In all cases, ACMS must have visibility into Army product data in terms of its identity, status, and form. For product data managed within the ACMS federation, it must be possible for authorized ACMS users to not only locate, but also retrieve the controlled product data.

A.1.3 Standard Core Metadata.

MIL-STD-2549, *Department of Defense Interface Standard, Configuration Management Data Interface,* defines the standard core metadata which must be sharable within and outside the ACMS federation. The data elements describe the configuration management data needed to support the principles of configuration management in accordance with EIA/IS-649, *National Consensus Standard for Configuration Management*. These data elements and the relationships depicted in MIL-STD-2549 also provide the basis for exchanging rudimentary product structure information in the form of parts and Bill of Materials data.

A.2 Specific ACMS Roles.

ACMS will serve as the Army's enterprise configuration and product data management system, as the Army-wide product data provider, as an interface provider, as an Army-wide product structure manager, and as a process enabler.

A.2.1 Army Configuration and Product Data Management System.

ACMS users will be able to find, view, copy, and print Army product data, regardless of whether the Army has change control authority or not. To accomplish this, each member of the ACMS federation will need visibility into all product data that is controlled and digitally stored. As a result, systems within and external to the ACMS federation will need to exchange metadata about this product data and provide access to their product data. This is necessary so that the data, an enterprise resource, can be widely shared. Generally, the Army will have change control authority over the product data managed within the ACMS federation and over Army product data stored in JEDMICS. ACMS will enable authorized users to create, find, manage, retrieve, view, redline, update as a new version, save as new data, or make some other use of product data for which the Army is the change control authority. Local ACMS implementations will be able to configuration manage their own vaulted product data, as well as product data they own, but physically store that data in external repositories such as JEDMICS.

A.2.1.1 Single, Comprehensive Product Data Manager.

In some instances, ACMS will function as the sole data management system and repository for a collection of product data. This includes directly providing for the physical storage and configuration management of the data, as well as for security and access control. Security and access control will include managing user authorizations, monitoring access, and providing for the check-in and check-out of data. In these cases, ACMS will be the only data manager for the data.

A.2.1.2 Shared Product Data Manager.

In other instances, ACMS will share data management responsibilities with other systems. Examples of other systems include unique Product Data Management (PDM), Configuration Management (CM), and CITIS systems owned and operated by individual programs, commands, or contractors. Data management features inherent in data authoring systems are another example of cases where ACMS will need to share data management responsibilities. Under these circumstances, ACMS will manage the defined core product metadata, while site specific PDM, CM, and/or CITIS systems will control the site's own engineering data (to include site unique metadata). Physical storage, configuration management, security, and access control of the data will be accomplished by the site's data management system(s). ACMS and the other data management system, however, will interface to exchange data and metadata (see A.1.3, Standard Core Data), so that ACMS can maintain enterprise-level visibility of Army product data.

A.2.1.3 Engineering Repository Manager.

For Army product data contained in or destined for JEDMICS, ACMS will be the Army entry point for retrieving product data for modification and for loading the product data itself and related file index data (a subset of ACMS metadata). This ensures that ACMS and JEDMICS data remain synchronized. ACMS will also provide for the configuration management of this data.

A.2.2 Army-Wide Product Data Provider.

With ACMS, it will be possible for any authorized user to identify and request any piece of product data for which the Army is the change control authority. ACMS will assist the user in

identifying the desired product data, locate and request the product data for the user, and then present the product data to the user in a usable form. Key implications that result from this role include the following:

- *Visibility*. As the enterprise product data management system for the Army, ACMS will have visibility into the identity and location of all controlled product data, regardless of whether it is owned by the Army or another organization.
  - *ACMS Federation's Principal Entry Point*. ACMS will be the Army's principal entry point into the Army's federation of configuration and product data management systems. This means that Army product data users will access and check-out Army-owned and controlled product data via ACMS. It also means that Army product data creators will use ACMS as the principal mechanism for placing Army product data under formal data management control.
  - *ACMS User's Entry to External Data Management Systems*. When ACMS does not have direct physical control of desired data (vaulted elsewhere), ACMS will formulate a request for the product data, submit the request to the controlling system, receive the requested product data or response notice, and make the result (requested data or response notice) available to the user. As a result, Army product data users will be able to find, copy, view, and print Army product data via ACMS even when ACMS does not directly manage the product data.
- *Product-Centric Data Management*. ACMS represents a shift in the Army from document-centric data management to product-centric data management. This change will enable users to identify desired product data by navigating product structures, searching for and through part families, as well as traditional approaches to finding product data via search queries on product data grouping or classification attributes. Product-centric data management also means that the product structure is a controlled item in addition to (or in place of) documents describing the product structure (e.g., Bill of Materials).
- *Web-Based Access*. ACMS will include the ability to access controlled product data via commercially available web browsers. Users of the ACMS will be able to access ACMS via the browser, find desired product data via search queries or product structure navigation, request and receive product data for viewing, printing, or copying (as new product data), and mark-up or redline viewable images.

A.2.3 Interface Provider.

ACMS will be fielded into a diverse environment of legacy systems that need to interact with ACMS. Examples of these systems include JCALS Workflow Management System, CITIS configuration management systems, JEDMICS, PDM-based CITIS systems, and other CITIS and PDM systems. Furthermore, as a federated system of systems, ACMS itself will need to exchange product data among several site-unique implementations of ACMS. As a result, the ACMS architecture will need to be open and embrace interface standards for interfacing with other systems. Specifically, the ACMS will need to have a published Application Program Interface (API). It also will need to migrate towards the configuration management data interface standard (MIL-STD-2549) as the means for defining what metadata must be exchanged among ACMS and other PDM, CM, and CITIS systems.

A.2.4 Army-Wide Product Structure Manager.

Product structure management is a new concept for managing Army-wide product data. It signifies a move away from document-centric data management philosophy to product- or part-centric product data management. ACMS will have visibility into the product structure and product data of any Army item, and configuration control of product data managed within the ACMS federation. Associated with the product structure, ACMS will provide visibility into the identity and location of all controlled, digital product data which describes elements of the product structure. Thus, users of Army-controlled product data may find the data by navigating the relevant product structure. Additionally, ACMS will support displaying multiple views of the product structure. For example, ACMS can present design views of the data which would show the design data associated with the product structure. A view by Configuration Items (CIs) would aid program managers and their support staff. Another view would be a manufacturing view. In this view, some design information would be presented, but manufacturing process descriptions and simulations also might be included. Other views are possible as well.

A.2.5 Process Enabler.

ACMS will enable various Army business processes by making product data widely accessible and by providing workflow tools that facilitate the distribution of tasks and data, as well as the monitoring and management of the processes modeled by the workflows. Specifically, ACMS will improve the efficiency of Army IPTs, engineering change action processing, and reprocurement Tech Loop activities by making it much easier to find and retrieve needed product data; by providing tools that enable users to view, mark-up, or comment on product data; by allowing concurrent access to product data; by distributing tasks, editable on-line displays, and notices of assigned tasks and product data availability via pre-defined and ad hoc workflows; and by supporting electronic sign-off on product data or tasks.

APPENDIX B. ACMS Support of Weapon Systems and Data Life Cycles

ACMS will provide support to both the weapon systems and data life cycles. Section B.1 below describes ACMS from the weapon system life-cycle perspective. Section B.2, ACMS Operation within Product Data Life Cycle, describes ACMS from the data life-cycle perspective.

B.1 ACMS Support of the Weapon System Life Cycle.

The envisioned scope of ACMS is to be the Army's enterprise configuration and product data management system throughout the life cycle of a weapon system, product, or program -- from development through production, operation, sustainment, modification, and ultimately disposal.

B.1.1 Development.

B.1.1.1 Continuous, Concurrent, and Wide-Spread Access.

ACMS will be the Army's primary mechanism for maintaining continuous and concurrent visibility into the content and status of developing weapon system product data. ACMS will be a key tool used by the Army to support the execution of the Integrated Product and Process Management (IPPM) concepts for developing weapon systems. Under the IPPM concept, IPTs will be formed from all user communities who have responsibility for, use, or support the weapon system at some point in its life cycle. By having ready access to developing product data, IPT members may influence the design early and avoid excessive life-cycle costs or expensive changes late in the system's development or manufacture. Examples of user communities include the following:

- Designers and engineers who develop the system,
- Testers who will test the weapon system,
- Manufacturers who must build the system,
- Program managers who must manage the system's development,
- Trainers who will develop training courses,
- Operational users who must use the system in the field,
- Logisticians and maintenance personnel who must sustain and maintain the system,
- Item managers who will buy replacements and spares for the weapon system,
- Operations planners, analysts, and modelers who will plan and study the best ways to employ the system, and
- Authors and subject matter experts who will write technical and operations manuals for the weapon system.

B.1.1.2 ACMS-Stored Product Data.

When ACMS or JEDMICS is used as the repository, authorized IPT members who create product data will be able to save data in secure, access-controlled storage areas, promote product data through various release levels, baseline product structures and product data, and

configuration control the product data. IPT members will have concurrent access to the product data, although ACMS will preclude multiple users from being able to simultaneously change the data. Note that in the context of ACMS, controlled product data will never be changed, but it may be revised and differentiated with a new revision identifier. ACMS will enable authorized IPT members who use, but do not create the product data, to find and retrieve product data they require; receive task notifications and accompanying product data via workflows and messaging capabilities contained within ACMS; view, comment on, and mark-up or redline product data using viewing tools provided by ACMS; and participate in design and engineering change evaluations even though individual IPT members are geographically and organizationally dispersed. ACMS also will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.1.1.3 Contractor-Stored Product Data.

When contractor data management systems store and manage the product data, ACMS will enable authorized IPT members who use, but do not create the product data, to find and retrieve product data they require; receive task notifications and accompanying product data via workflows and messaging capabilities contained within ACMS; view, comment on, and mark-up or redline product data using viewing tools provided by ACMS; and participate in design and engineering change evaluations even though individual IPT members are geographically and organizationally dispersed.

B.1.2 Production.

By making design data accessible as it evolves, ACMS will enable the manufacturing community to be aware of and more readily influence the weapon system design. Additionally, during weapons system manufacture, ACMS will enable authorized members of the manufacturing community to rapidly find and retrieve design, manufacture, test, and analysis data that affect the development of manufacturing processes, the acquisition or configuration of manufacturing equipment, and the procurement of manufacturing materials. This will facilitate early planning and evaluation of manufacturing alternatives. For example, manufacturing simulations can be prepared early on based on evolving product data. These simulations may reveal design problems from a manufacturer's perspective, and also will enable the manufacturer to begin planning the production process sooner. Additionally, manufacturers will be able to initiate change actions or participate in change evaluations using ACMS' engineering change action on-line displays, workflows, and viewing and mark-up capabilities. ACMS will provide them with access to supporting product data, thus enhancing the quality of engineering change actions. ACMS also will enable a preparer of an engineering change action to determine if similar or related engineering change actions are in process, have been rejected, or have been approved. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.1.3 Operation.

ACMS will provide authorized operational users of a weapons system with rapid access to the product data they need to more efficiently plan the system's use, operate the system, and employ the system, as in the following examples:

- Operations analysts might use physical attributes of the system as input into an operational simulation. The simulation would indicate how well the system performed in a specified scenario. In another example, force planners might use design and other forms of product data to determine interoperability between systems.
- Deployment planners might use product data to determine or simulate transportation requirements for the weapon system.
- Survivability analysts could access design data that provides inputs to survivability models for predicting weapon system survivability against certain threats in certain scenarios.

Like members of the manufacturing and other communities, authorized operational users will be able to initiate change actions or participate in their evaluation using ACMS' engineering change action on-line displays, workflows, and viewing and mark-up capabilities. ACMS will provide them with access to supporting product data, thus enhancing the quality of engineering change actions. ACMS also will enable a preparer of an engineering change action to determine if similar or related engineering change actions are in process, have been rejected, or have been approved. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.1.4 Sustainment.

Logisticians, maintenance personnel, and engineers will benefit from ACMS' ability to provide them with access to needed engineering and analytical data during the sustainment phase in the following ways:

- Logisticians could use design or analytical data to help them predict replacement and spares rates.
- Maintenance workers could access ACMS when servicing equipment in the field when a particularly unusual or difficult maintenance event occurs. Using ACMS, the maintenance community will be able to record field maintenance actions.
- Obsolescence is a significant issue for many commodities within the Army. Engineers often must reengineer obsolete parts. With ACMS, engineers would be able to locate supporting product data, store their reengineered data, and then find it again in the future, so it does not have to be reengineered a second time.

Selected logisticians, maintenance personnel, and engineers will be able to initiate engineering change actions or participate in their evaluation using ACMS' engineering change action on-line displays, workflows, and viewing and mark-up capabilities. ACMS will provide them with access to supporting product data, thus enhancing the quality of engineering change actions. ACMS also will enable a preparer of an engineering change action to determine if similar or related engineering change actions are in process, have been rejected, or have been approved. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.1.5 Disposal.

Disposing, recycling, or salvaging retired weapon systems can benefit from ready access to product data via ACMS. With ACMS the individuals responsible for the disposal of a system will

be able to better plan through access to product data on the various configurations that have been fielded. They also will be able to identify hazardous or precious materials that may be included in the system. If desired, the product data could include handling instructions for these materials. Like the other communities involved in the life cycle of a weapon systems, the disposal community will be able to develop, receive, and evaluate engineering change actions via ACMS. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.2 ACMS Operation within Product Data Life Cycle.

This section describes the support ACMS provides from the perspective of the data's life cycle -- from its acquisition or creation, through its management and use.

B.2.1 Data Acquisition.

B.2.1.1 Overview.

Product data acquisition involves the creation, revision, purchase, conversion, or any other method of obtaining new Army product data. The acquired product data may be authored by the Army, developed for the Army under contract, or purchased by the Army. Acquired product data also includes new revisions of existing data. The acquired product data may be physically retained by the Army or by a third party such as a contractor. The new product data includes actual engineering data representations of products (e.g., drawings, models, software, and documents such as requirements and specifications), product structure representations, configuration control data, engineering change actions, mark-ups and redlines, relationships between product data, relationships between product data and product structure elements, and other data about the product data (metadata). All are types of product data captured and controlled by ACMS.

B.2.1.2 Operational Concept.

ACMS will support data acquisition primarily by providing the means to introduce acquired product data into the ACMS environment of managed data. With a few exceptions, as described later in this paragraph, the actual authoring of product data is outside the domain of ACMS. ACMS will support the introduction of acquired product data into the Army's environment of managed data, however, by providing the capability to capture and securely store authored product data via its data vaulting capabilities. ACMS also will provide mechanisms for obtaining product data, to include metadata, from contractors. These mechanisms will be based on standards such as STEP (STandard for the Exchange of Product model data - ISO 10303), CALS (Commerce At Light Speed), and MIL-STD-2549, along with an open and published API. In these cases the actual product data authoring is done external to ACMS. On the other hand, ACMS will support the direct creation of some product data by providing data authors with the capability to build product structures, assign relationships between instances of product data, and establish relationships between specific product data items and product structure elements. Using system administrator-configurable on-line editable displays and automated rules, ACMS also will enable product data authors to initialize configuration control data. This includes assigning configuration item identifiers, generating engineering change actions, and recording evaluations of engineering change actions by using ACMS on-line editable displays and viewing/mark-up tools.

The following subparagraphs provide descriptions of specific ACMS operational capabilities that will support the acquisition of Army product data.

B.2.1.2.1 Secure Product Data Storage.

ACMS will provide for secure storage of acquired product data in accordance with defined access control permissions and rules. Secure storage is defined as the ability to preclude stored information from being viewed, reused, updated, or deleted in violation of ACMS access permissions and rules. Examples of the kinds of data ACMS will store and protect include product data files in native or standard formats, metadata associated with managed product data, administrative data, references to product data external to ACMS, and on-line editable displays such as engineering change actions.

B.2.1.2.2 Check-In Product Data.

Checking product data into the ACMS is one means by which product data is entered into the ACMS environment of managed data. Upon initiation of the check-in function, ACMS will present an authorized product data author with an editable display of required ACMS metadata. The metadata fields on the editable display will be empty or will contain existing or default values (existing values are for product data that is being revised; default values are for new product data that is being loaded for the first time). The user will enter, modify, or accept the metadata and proceed with the check-in operation. ACMS will then copy the product data, to include metadata, from the user's workspace into the ACMS vault assigned to the user. ACMS will notify the user as to the success of the transaction and will make the core metadata available to all systems within the ACMS federation. The user may not need to know the actual physical location of the product data. If the product data had been checked out for revision, ACMS will release the check-out lock at this time. ACMS also will support batch loading of product data, to include metadata.

B.2.1.2.3 Populate JEDMICS and Other External Repositories.

ACMS will be able to populate external repositories that store product data for which the Army has change control authority. JEDMICS is one example of such a repository. One way in which Army product data owners or authors will populate JEDMICS is by using ACMS check-in features. ACMS will present default values for required ACMS metadata to the user who will modify or accept the metadata. From this metadata, ACMS will prepare the associated JEDMICS file index data. The user will then initiate the JEDMICS load procedure. ACMS will copy the product data from the user's workspace and transmit both the file index data and product data to JEDMICS. JEDMICS will store the product data received from ACMS and populate the JEDMICS file index with the necessary metadata provided by ACMS. JEDMICS will then send back to ACMS any file index data that JEDMICS produces or revises (e.g., file location). ACMS will then update its own metadata to keep the systems synchronized. If necessary, JEDMICS will send ACMS notices that indicate whether or not the transaction was successful. ACMS will present the notices to the user for his or her action if necessary. Using ACMS to load JEDMICS with new Army product data will preserve the integrity of ACMS metadata and ensure ACMS and JEDMICS are synchronized. ACMS also will support batch loading of external repositories such as JEDMICS.

B.2.1.2.4 Translate Files.

In the future, ACMS will include a set of file translators that produce STEP and CALS-compliant formats. In support of user requests for data, ACMS will schedule and route files to appropriate file translators, apply default settings for translations, initiate the translation, and route the output file to the user.

B.2.1.2.5 Build Product Structures.

The creation of product structures is a form of product data authoring. ACMS will provide for the creation of new product structure elements such as assemblies, components, and parts. These parts may then be associated (i.e., related or linked) in a hierarchical manner to represent a newly defined product. ACMS will present the hierarchical product structures to users via a graphical display. Product structures may be revised and retained as new revisions. ACMS will provide for creating, recording, and maintaining multiple versions for a given product structure element. ACMS also will provide the ability to specify and maintain product structure effectivity information on when a part revision is valid for use in assembling a particular revision of a product. ACMS also will be able to import product structure relationships authored elsewhere.

B.2.1.2.6 Author Relationships.

In addition to the product structure relationships described above, ACMS will allow for authoring the following kinds of relationship data: links between product data and product structure elements, links between two different pieces of product data, and the type of links themselves. The links between product data and product structure elements are the means by which product data is associated with particular product structure elements. These links will enable ACMS users to find product data by navigating product structures. The links between different product data are the means by which two pieces of product data are related to one another. The type of link defines the nature of the relationship. The link type itself can be created and defined by system administrators, thus allowing product data authors to create new ways of describing the relationships. ACMS also will be able to import relationship data authored elsewhere. This includes the following kinds of relationship data: links between product data and product structure elements, links between two pieces of product data, and the type of links themselves.

B.2.1.2.7 Create, Associate, and Track Engineering Change Actions.

ACMS will enable users to create, associate, and track engineering change documents against product data. Once into ACMS, the change initiator will request a standard editable on-line engineering change action display. ACMS will present the display, which may have been tailored by the local system administrator, to the change initiator who inspects the default data provided by ACMS and makes changes and additions as necessary. ACMS will automatically assign the next available unique engineering change action number. The change initiator will use the ACMS query/search and/or product structure navigation capabilities to find any product data that needs to be attached to the engineering change action display and submit the engineering change action for consideration via a predefined engineering change action workflow.

B.2.1.2.8 Redline Images.

Redlined or marked-up viewable images are another kind of product data that is acquired using ACMS. ACMS will provide the ability for multiple reviewers to create redlines, mark-ups, or annotations to viewable images. This reviewer-created product data will be controlled and maintained in conjunction with the viewable image. ACMS will ensure, however, that individual reviewer redlines and annotations are kept distinct.

B.2.1.2.9 Web-Based Access.

Product data authors with access to a web browser will be able to create and check product data into ACMS using the browser and the Internet. ACMS will provide a full-function, web-client interface for users who access ACMS using a web browser.

B.2.1.2.10 Acquire Metadata.

Metadata may be acquired via ACMS from both product data authors and external data management systems. When checking in product data, ACMS will present the author or owner with a predefined display to be completed. Where default values exist, ACMS will populate the display with those defaults for the author to modify or accept. ACMS will store and control access to the metadata for future use. Metadata also will be obtained by ACMS from external data management systems. At a minimum, ACMS will be capable of importing MIL-STD-2549 data elements from external systems.

B.2.2 Data Management.

B.2.2.1 Overview.

In the data management phase of product data's life cycle, the main objective is to control the product data in such a way that the data is protected without unnecessarily burdening the product data authors while facilitating authorized users in finding, retrieving, and working with the product data. The main activities under data management include storing product data, protecting product data by controlling access while making it easily accessible to authorized users, configuration managing product data, distributing product data in response to authorized requests, archiving and backing up product data, and recording the status of product data and changes in that status.

B.2.2.2 Operational Concept.

ACMS will provide visibility into all official Army digital product data. ACMS will provide configuration control of Army product data for which the Army is the Current Document Change Authority (CDCA). All local implementations of ACMS will share metadata and access to Army product data. These local implementations of the ACMS federation, however, will exercise change and check-in/out control for product data that they store and manage locally. This means that while the local implementations of ACMS will exercise physical control over the product data, any ACMS user will be able to find and retrieve any data maintained within the ACMS federation. The notion of shared product data access is further extended when ACMS exchanges metadata with external PDM, CM, or CITIS systems. This exchange will provide ACMS with visibility into what product data is available and where it is located. As the Army's primary mechanism for accessing product data, ACMS will interact with the external systems to request

the product data when needed. The following subparagraphs describe specific ACMS operational capabilities that will support the management of Army product data.

B.2.2.2.1 Store and Protect ACMS Vaulted Product Data.

ACMS will provide a product data vaulting capability. This capability is for storage of product data over and above that which is kept in repository systems such as JEDMICS. The ACMS vault will not only securely store traditional product data such as drawings, models, and documents, but it also will store and protect viewable images, redlines and mark-ups of viewable images, metadata associated with managed product data, administrative data, references to data external to ACMS, and editable on-line displays such as engineering change actions. ACMS will protect the product data by restricting access to the data in accordance with defined access control permissions and rules. ACMS will have the ability to vault product data under its control in distributed vaults. ACMS also will protect Army product data stored in JEDMICS, as well as product data for which the Army has change control authority and is stored in other external repositories, by serving as the Army's single entry point into these repositories for the purposes of both loading and retrieving product data.

B.2.2.2.2 Locate Product Data Within the ACMS Federation.

Users of ACMS will be able to locate and retrieve any product data managed under the ACMS federation of systems. An ACMS user will find product data by querying metadata or by navigating product structures. It may not be necessary for the user to know the specific location of the product data in the ACMS federation. The user will be prevented from querying metadata which he or she is not authorized to see. Similarly, the user will be precluded from navigating product structures for which he or she is not authorized to view.

B.2.2.2.3 Control Access to Product Data When the Army Has Change Control Authority.

Access control is the mechanism by which ACMS protects the integrity of product data and guards it from unauthorized identification and retrieval. ACMS will manage and monitor authorizations and restrictions to product data for which the Army has change control authority. This includes product data vaulted by ACMS and product data stored in JEDMICS or other external repositories storing product data for which the Army is the change control authority. ACMS also will protect the integrity of the product data through check-in and check-out functions.

B.2.2.2.3.1 Authorizations and Restrictions.

ACMS will provide for checking users' identities and authorizations and restricting their ability to see metadata, navigate product structures, and retrieve product data as defined by access control permissions and rules. These permissions and rules will enable system administrators to restrict access to ACMS by type of information, the status of the data (release level or specific baseline), data sensitivities and distribution limitations, and the roles assigned to a user or group. ACMS access rules will define the types of access allowed to users, groups, or roles (create, read, use, or delete). Attempts to access controlled product data will be monitored and users whose

unsuccessful attempts exceed a system administrator-specified maximum threshold will be exited from the system and the unauthorized attempts to access product data will be recorded.

B.2.2.2.3.2 Check-In ACMS Vaulted Product Data and Populate JEDMICS.

Product data check-in supports both the data acquisition and data management life-cycle phases. It is the means by which new or revised product data is brought under ACMS' control, hence the association with data acquisition. It also is a means of managing the integrity of controlled product data, hence the association with data management. The data acquisition section above discusses product data check-in -- see Section B.2.1.2.2, Product Data Check-In.

Populating JEDMICS is a special case of product data check-in. The data acquisition section above discusses populating JEDMICS -- see Section B.2.1.2.3, Populate JEDMICS and Other External Repositories.

B.2.2.2.3.3 Check-Out ACMS Vaulted Product Data.

Once the desired product data is found, either as the result of a successful query or through product structure navigation, the user will initiate the ACMS check-out function. If the user is authorized to access the product data and the data is vaulted by ACMS, then ACMS will respond by copying the requested files or information (e.g., drawing, model, or document) from the ACMS vault to the user's workspace. Upon check-out, ACMS will lock the requested files to prevent multiple users from attempting to modify the product data simultaneously. Other users will be allowed to view and copy the checked out product data (the copy would be treated as new data), but they would not be able to modify it or create new versions until the check-out is released. ACMS will provide the ability to view which user has checked the product data out from the vault. If the user who has checked the product data out decides he or she no longer intends to modify the product data and only wants to view the data or work with a copy, then he or she may release the lock if so desired, thus freeing the check-out for other users.

B.2.2.2.3.4 Retrieve JEDMICS Stored Product Data.

Army product data users will check product data out of JEDMICS via ACMS. An ACMS user will find JEDMICS product data using queries or product structure navigation. The user will initiate the ACMS check-out function and ACMS will prepare and transmit request for the product data to JEDMICS. ACMS will receive the product data from JEDMICS and present it to the user. If necessary, JEDMICS will send ACMS notices that indicate whether or not the transaction was successful. By using ACMS to retrieve JEDMICS-stored product data, it will be possible to manage use of Army product data, make sure that users are receiving the correct product data, and facilitate concurrent engineering efforts. The same file locking and metadata update procedures described in the previous paragraph will apply for checking out JEDMICS stored product data.

B.2.2.2.4 Distribute Product Data.

ACMS will provide for the routing and transport of product data in support of numerous operations and events. Specifically, ACMS will copy product data between a user's workspace and the ACMS data vault in response to check-in and check-out operations, pre-defined event triggers, or workflow prompts. ACMS also will support product data exchanges among the

systems within the ACMS federation and with external repository, PDM, configuration management, and CITIS systems. ACMS will record information about the product data transport transaction. For example, ACMS should record the time, initiator, and recipient of the transaction.

B.2.2.2.5 Exchange Product Data When the Army Does Not Have Change Control Authority.

B.2.2.2.5.1 Receiving Product Data from External Data Management Systems.

ACMS will be responsible for providing visibility into and access to all Army product data. When the Army does not have change control authority over the product data and it is controlled by and vaulted in data management systems external to the ACMS federation, ACMS will need to be capable of receiving both product data and data about this product data (metadata) from the external data management system. Examples of these external data management systems include PDM, CM, CITIS, or authoring systems. To accomplish this, ACMS will need to have a published API and will need to migrate towards the configuration management data interface standard (MIL-STD-2549) as the means for defining what metadata must be exchanged among ACMS and other PDM, CM, and CITIS systems. MIL-STD-2549, *Department of Defense Interface Standard, Configuration Management Data Interface,* defines the standard core metadata which must be sharable within and outside the ACMS federation. The data elements describe the configuration management data needed to support the principles of configuration management specified in EIA/IS-649, *National Consensus Standard for Configuration Management*. These data elements and the relationships depicted in MIL-STD-2549 also provided the basis for exchanging rudimentary product structure information in the form of parts and Bill of Materials data. Once ACMS determines that the desired product data is located in an external system and if the user requests the product data, then ACMS will formulate a request for the product data, initiate a session with the system that controls and stores the product data, submit the request, receive the requested product data or appropriate response notice, and present the results (product data or response notice) to the ACMS user. As a result, Army product data users will be able to find, view, copy, and print Army product data via ACMS even when ACMS does not directly manage the product data.

B.2.2.2.5.2 Providing Product Data to External Data Management Systems.

ACMS also needs to be capable of providing product data, to include metadata, to external systems when the Army provides product data to contractors or other government entities. As a result, ACMS will be capable of exporting MIL-STD-2549 data elements for external systems.

B.2.2.2.5.3 Synchronizing with External Data Management Systems.

In some instances, ACMS will need to be kept synchronized with an external data management system. Depending on the level of integration between ACMS and the external data management system, this synchronization will either be done automatically or procedurally. The approach will be determined during implementation. An example of a procedural approach to synchronization between ACMS and an external data management system is when the owner or author of the product data assumes responsibility for logging into ACMS and updating ACMS as to the state of the controlled product data.

Automatic synchronization can occur several ways. One approach involves integrating ACMS into the external data management system, so that access to and control of the product data is through ACMS. Other methods of automatic synchronization include pushing metadata about changes to the product data from the external data management system to ACMS on a regular basis. Another approach involves ACMS pulling the state-change metadata from the external data management system by polling the external system at regular intervals. A third approach to automatic synchronization involves retrieving the metadata from the external system on a "when needed" basis and comparing the retrieved metadata with ACMS' metadata to determine if changes have occurred.

B.2.2.2.6 Workflow Capabilities.

ACMS will include the ability to distribute tasks and product data via workflow capabilities. Specifically, ACMS will provide users the ability to build, participate, and monitor pre-defined and ad hoc workflows. ACMS will permit users to build, participate, and monitor ACMS workflows using a web browser across the Internet or via a regular ACMS client application. ACMS also will interface with the JCALS Workflow Manager.

B.2.2.2.6.1 Workflow Builders.

Authorized ACMS users will be able to build workflows. These workflows may be saved as templates or executed as ad hoc workflows. The creator of a workflow will be able to build sequential and concurrent tasks, establish timed and event triggers, and assign roles to users with specific data access rights for specific tasks within the workflow.

B.2.2.2.6.2 Workflow Participants.

A participant in a workflow will receive notifications of workflow tasks. ACMS will enable participants to check their work queues, select a specific task on which to work, read any task messages or notifications that accompany the task, retrieve product data that has been associated with the task, and electronically sign-off on task completion or product data.

B.2.2.2.6.3 Workflow Monitors.

Selected ACMS users will be able to monitor the progress of tasks within the workflow. This includes being able to determine which tasks have been completed, which tasks are late, and the workloads of individuals participating in the workflow. Again this function may be performed either via a web browser or the ACMS client application.

B.2.2.2.7 Configuration Manage Product Structures and Product Data.

ACMS will configuration manage product structures and product data in accordance with the guidance provided in MIL-HDBK-61, *Configuration Management Guidance*, and MIL-STD-2549, *Configuration Management Data Interface*. Specifically, ACMS will enable users to record the following:

- Unique identifiers for configuration items (CIs) and their subordinate parts and assemblies ,
- The identifier of each CI's configuration control authority,
- The unique identifier of configuration baseline product data,

- The release and baseline status of any ACMS controlled product structure or data item,
- The correlation between product data and the product structure element it represents,
- Unique file identifiers (to include time/date stamp),
- Part numbers corresponding to CIs and subordinate parts and assemblies,
- Effectivity and release times and dates for product structures and product data,
- Identifiers and status of engineering change actions,
- Results of configuration audits, and
- Engineering change action and audit actions assigned to individuals.

B.2.2.2.8 Record and Report on Product Data Status.

ACMS will record and present to authorized users the release, baseline, change, and audit status of product structures and product data. In particular, ACMS will provide authorized users with the capability to record the release levels of specific product structures and product data, when the product structure or product data was promoted to the indicated release level, and when the release became effective. Authorized users will be provided the ability to generate displays and reports containing the above release status data. ACMS also will enable authorized users to record the identity of a baselined product structure and related configuration data, along with when the baseline was approved and the effective date of the baseline. ACMS will also record and report on the status of engineering changes, actions associated with the changes, and the implementation status of changes. As audits are performed, ACMS will record and report on the schedules, status, and results of configuration audits.

B.2.2.2.9 Archive and Backup Product Data.

ACMS will provide system administrators with the tools necessary to establish and maintain archives and backups of product data kept in ACMS vaults. In the event of corruption or other damage to the ACMS data vault, ACMS will enable system administrators to restore the system from backups. Similarly, ACMS will provide system administrators with the tools needed to request and retrieve historical archives information from off-line archival storage. ACMS will provide for backup operations at remote sites for each site as part of the Army's Continuity of Operations Plan (COOP) for product data.

B.2.3 Data Use.

B.2.3.1 Overview.

Use of product data within the data's life cycle involves all activities which require a direct interface with a consumer of the data, as opposed to an author or manager of data. Example activities performed by consumers include finding, requesting, receiving, viewing, analyzing, processing or manipulating, and printing product data. Sometimes copying and redlining product data are considered activities within the data use life-cycle phase, but for the purposes of this discussion, they are part of the data acquisition phase discussed earlier.

B.2.3.2 Operational Concept.

ACMS is a configuration and product data management system. Its support of the data use life-cycle phase is limited to assisting consumers of product data in finding, requesting, receiving, viewing, and printing product data. There are two categories of ACMS product data consumers: individuals and applications. Individuals typically will interact with ACMS via ACMS client software or across the Internet using a web-based browser. Individual consumers will find product data by navigating product structures or by querying metadata. Once product data is located, the individual consumer will initiate a request for the data which ACMS will retrieve and present to the consumer. After receiving the product data, the consumer will use ACMS or local viewing tools to view the product data and, if desired, print the image.

Applications which are consumers of Army product data will interact with ACMS by an open and published interface. The interface may involve exchanging product data, to include metadata, or it may involve the application invoking an ACMS feature.

The following subparagraphs provide descriptions of specific ACMS operational capabilities that will support the management of Army product data.

B.2.3.2.1 Navigate Product Structures.

Users of ACMS will be able to locate and request product data managed under the ACMS federation of systems by navigating product structures. The user will only be able to navigate product structures for which he or she is authorized to view. Product structures may be navigated via ACMS' web-based browser capability or via ACMS client software. It will not be necessary for the user to know the specific location of the product data in the ACMS federation.

B.2.3.2.2 Search Product Data Attributes.

ACMS users also will be able to search for product data by constructing queries against product data attributes. ACMS will provide the ability to group product data which share a common set of required attributes. Once a user determines which class or group of product data they need, it will be possible for the user to build queries to locate particular instances of the group. The queries, which may be saved for later reuse, will provide the ability to search attributes associated with the particular grouping for specific values, ranges of values, and logical combinations using Boolean operations. Because the system administrator will have the ability to restrict a user's access to specific product data attributes, ACMS will also be able to restrict the types of queries users can create. Product data searches via queries may be created and initiated from ACMS' web-based browser capability or from the ACMS client software. As before, it may not be necessary for the user to know the specific location of the product data in the ACMS federation.

B.2.3.2.3 Request and Retrieve Product Data.

Once product data has been found within ACMS, either as the result of a successful search, through product structure navigation, or association with a workflow task, the user will initiate the ACMS check-out function. If the user is authorized to access the product data, ACMS will respond by checking out the requested product data from the ACMS vault and copying it to the user's workspace. ACMS will perform this operation regardless of whether the user has accessed ACMS via a web browser or via an ACMS client application. In some cases, the request for

product data includes launching a viewing or authoring application. If the requested file requires translation prior to presentation to the user and an appropriate translator has been included as part of ACMS, then the request and receipt of the product data will trigger an automatic translation of the product data for the user.

B.2.3.2.4 View Images.

ACMS will provide a number of imaging services that enable a user to view and redline images. ACMS will provide for the launching of viewing and redlining software applications via file associations. When a file is checked out using ACMS and the file type is of a particular type, ACMS will launch the appropriate software to either view, redline, or, in some cases, first translate the file to a form that can be viewed or marked up. ACMS will control and protect the viewable and redlined images. ACMS also will ensure that individual reviewer redlines and annotations are kept distinct.

B.2.3.2.5 Print Product Data.

As part of its support to the data use life-cycle phase, ACMS will provide users with the ability to print viewable images and redlines. Specifically, ACMS will provide established reports such as technical data package lists **(**TDPLs), generic breakdown lists (GBLs), and where-used reports. ACMS must also provide performance-based reporting and the ability to produce process information.

APPENDIX C. ACMS Support to Selected Business Processes

C.1 Introduction.

The following paragraphs present examples of ACMS operational capabilities being applied in support of three business processes. This is done to tie the various operational capabilities described in Appendix B and illustrate their use in Army processes that require product data. The three processes presented are Integrated Process Team (IPT) Information Sharing, Engineering Change Action Processing, and Technical Data Package (TDP) Validation.

C.2 IPT Information Sharing.

During system development, ACMS will provide authorized IPT members simultaneous access to current, relevant product data. IPT members are apt to be geographically dispersed and represent a variety of communities, each having different life-cycle responsibilities for the system. As such, they will work with the product data in different ways. All will require the ability to rapidly identify product data they need and to retrieve that product data in a form in which they can use.

C.2.1 Product Data Creation.

Creators of product data on an IPT may use ACMS to create working and released product data. Both types of product data will be vaulted in a secure environment where access to the product data is strictly controlled via user, group, and file type permissions.

C.2.1.1 Working Product Data.

Working product data represents work in-progress. Only product data creators may make changes to the data, but select members of the IPT may be given view or copy access to the product data. In the early stages of its life, working product data need not be revisioned. In this circumstance, the state of the product data is highly dynamic. It may be stored in a secure vault where other members of the design team and possibly other members of the IPT can access the product data, but the revision identifiers need not be updated. Product data creators are trusted to coordinate changes they make, but are not required to establish new revisions until the product data reaches an appropriate level of maturity. When a change is being made, the non-revisioned product data is checked out from ACMS. This locks the product data from changes by others, but does not preclude other users from copying or viewing the product data. When the product data is checked back in, the product data is released for check-out by others, but is not revisioned. As the product data matures, the design team may elect to move their working product data into a vault where the product data is revisioned. Once this happens, each time the product data is check-out, revised, and then checked back in to the vault, a new revision is created. Eventually, as the data matures further, it will become time to formally release the data for access to a wider audience. ACMS will enable the current data change authority to have a workflow created for release review (or retrieve a saved workflow). The product data that is a candidate for release will routed through the workflow along with an editable on-line release review display where comments and electronic sign-offs can be captured. Reviewers will retrieve the product data using ACMS, mark-up or redline a viewable image, add comments to the on-line review display, and either recommend the product data be reworked or add their electronic signatures to the sign-

off. When the product data successfully progresses through the review, the product data will transition from working product data to released product data and will be subject to formal configuration control rules and processes.

C.2.1.2 Released Product Data.

Released product data represents data that is under formal configuration control. It may not be changed, but new revisions can be created via a formal engineering change process (described later). Released developmental data, delivered data, and baselined data can fall into this category of product data. Like working product data, released product data is vaulted and subject to access control rules. New revisions of released product data may be created, but it does not constitute a new release until after an engineering change action successfully passes through the formal engineering change process. A trusted data creator then checks out the current revision of the released product data, makes changes using an authoring application, and then saves (checks in) the revised product data as a new revision and a new release. Changes to baselined releases of product data is supported in a similar manner. The difference is that the change control process must go through a Configuration Control Board (CCB) prior to accepting the change and, both the release status attribute and the baseline status attributes of the product data will change

C.2.2 Concurrent Access to Product Data.

A key assumption in the use of IPTs is that members will have simultaneous access to current, relevant product data. Sometimes this required data will be working product data. In other cases, the data will be released and possibly baselined product data. In either case, ACMS will make the product data available to authorized IPT members. It also is desired that users access to the product data be based on their responsibilities and roles, not where they reside geographically or organizationally.

C.2.3 IPT Member Access to Product Data.

ACMS will allow members of an IPT to access ACMS via ACMS client software or a commercial web browser. Based on the member's rights, ACMS will control the member's access to product data. The IPT member will be able to search or navigate ACMS for product data on a particular part, component, or product. Searches will be possible via query or search displays. These queries or searches will be performed against attributes of the product data contained in the set of metadata. The actual displays will be customizable by the ACMS system administrator. ACMS also will enable the IPT member to find product data by navigating product structures. Once desired product data is found, the IPT member will be able to request either a display of metadata, a viewable image of the product data, or the source product data (e.g., CAD model). If the product data is checked out by someone else, ACMS will retrieve a copy of the requested product data. If the product data is available for check-out and the IPT member has check-out permissions, ACMS will check the product data out and present it to the IPT member. In some instances, ACMS will actually provide the tool necessary to view or translate the product data. In other instances, ACMS will launch a viewing or authoring application for the member. Displays of metadata will be customizable by an ACMS system administrator.

C.2.4 Data Use as Part of a Workflow.

Many IPT members will be users who do not create product data, but review, evaluate, or reference product data on an regular basis. This can be done as part of a specific task for which they are responsible, in preparation for a major milestone, or as part of a process such as obtaining approvals to release product data. In some of these cases, the IPT members will need to find, retrieve, and view product data just to understand the current state of the requirements, design, or manufacture. In other cases, they will be an active participant in a pre-defined or ad hoc workflow where they need to review product data purposes as part of an assigned task. The following paragraphs describe IPT use of ACMS in a workflow situation.

C.2.4.1 Workflow Builder.

Authorized members of an IPT will be able to build ACMS workflows. These workflows can be saved as templates or executed as ad hoc workflows. IPT members who build workflows will be able to build sequential and concurrent tasks, establish timed and event triggers, and assign users to roles with specific data access rights for specific tasks within the workflow. Workflows may be built so that the rights of specific users or the rights associated with specific roles are temporarily restricted or expanded once the task becomes active.

C.2.4.2 Workflow Participant.

As a participant in a workflow, an IPT member receives notifications of workflow tasks. ACMS will enable IPT members to check their work queues, select a specific task on which to work, read any tasking messages or notifications that accompany the tasking, retrieve product data that has been attached to the tasking, and electronically sign-off on tasks or product data.

C.2.4.3 Workflow Monitor.

Authorized IPT members will be able to use the web browser to monitor the progress of tasks within the workflow. This includes being able to determine which tasks have been completed, which tasks are late, and the workloads of individuals participating in the workflow.

C.3 Engineering Change Action Processing.

ACMS will support engineering change action processing using workflow management capabilities, predefined displays, linking of change data to engineering change action documents, and voting and electronic sign-off capabilities. ACMS "where-used" product structure management capabilities and product structure element to product data associations also will enable ACMS to facilitate change impact analyses. Engineering change action processing involves creating an engineering change action document, routing the engineering change action document and attached product data to participants in the engineering change action evaluation process, performing change evaluations, capturing comments and mark-ups, approving proposed changes (voting and electronic sign-off), and initiating change implementation actions (work orders and instructions).

C.3.1 Creating an Engineering Change Action.

A change initiator requests a standard editable on-line engineering change action display from ACMS. ACMS presents the display to the change initiator who inspects the default data provided

by ACMS and makes changes and adds data as necessary. ACMS will automatically assign the next available unique engineering change action number. The change initiator uses ACMS' query/search and product structure navigation capabilities to find any product data that needs to be attached to the engineering change action editable on-line display. The engineering change action on-line display may be customized by the local system administrator.

C.3.2 Creating an Engineering Change Action Workflow.

Depending on the engineering change action, local operational procedures, and local preferences, engineering change actions can be distributed via ACMS' predefined or ad hoc workflows. Engineering change action workflows can be built from sequential and concurrent tasks, can have timed and event triggers, and can assign users to roles with specific product data access rights for specific tasks within the workflow.

C.3.3 Distributing an Engineering Change Action and Attached Product Data.

A change initiator submits an engineering change action display and attachments for distribution to change evaluators. Depending on command preferences, there are several options for initiating the distribution of an engineering change action. One option is to send the engineering change action and attachments to a change administrator who is then responsible for further distribution of the engineering change action (e.g., invoking an appropriate workflow). A related option is to establish a "drop box" location in ACMS for candidate engineering change actions. The change administrator would periodically checked the "drop box" and distribute new engineering change actions. A third option is to configure or customize ACMS to automatically route a new engineering change action in accordance with a predefined workflow, once the engineering change action is submitted by a change initiator. In this case, a new engineering change action triggers an automatic process within ACMS. Regardless of the option for initiating a distribution, participants in the workflow will be assigned, their roles established (which in turn establishes their access rights), and engineering change actions will be routed based on predefined or ad hoc workflows.

C.3.4 Performing Change Evaluations.

Participants in an engineering change action workflow will be notified by e-mail of tasks. ACMS will provide workflow participants with a means to identify outstanding workflow tasks. Participants will select tasks on which to work and use ACMS to retrieve product data necessary to conduct the engineering change action evaluation. Product data attached to the engineering change action will be retrieved directly from ACMS' representation of the task. Any other product data that the evaluator deems necessary will be located and retrieved using ACMS' query/search, product structure navigation, and check-out capabilities. Additionally, evaluators will use ACMS' where-used capabilities and multiple views of product structures to facilitate the conduct of impact analyses. For example, a manufacturing view of the product structure will help identify manufacturing process data that may be impacted by a proposed change. Likewise, a testing view of the product structure might reveal the need to change test plans. The ACMS engineering change action on-line display will include the capability to attach evaluator comments and recommendations. In some cases, evaluators will use the mark-up or redline features of ACMS on viewable images to indicate concerns or recommendations. In other cases, an evaluator may retrieve a copy of product data from ACMS and use an authoring application to

create an alternative to the proposed change. This would be saved as new product data, separately controlled, but attachable to the workflow. Upon completion of the evaluation, an evaluator will electronically indicate task completion using ACMS. This will trigger ACMS to move the engineering change action on through the workflow.

C.3.5 Approving Proposed Changes (Voting and Electronic Sign-Off).

At some point in the engineering change action workflow, members of the Configuration Control Board (CCB) will be tasked to vote on the acceptability of the engineering change action. ACMS will provide the ability to record these votes and protect against unauthorized or premature voting. ACMS also will tabulate the votes and present them to the individual responsible for formally approving the engineering change action. ACMS will record the electronic sign-off or rejection of the engineering change action.

C.3.6 Initiating Change Implementation Actions.

As a result of a decision to make a change, it is necessary to initiate a series of change implementation actions. Depending on individual command preferences and policies, the change implementation actions can be initiated and managed via ACMS workflow capabilities. A change implementation workflow would start with a CCB directive which orders that the change be made. This directive would be submitted to an ACMS workflow with relevant contract, program management, and financial data as attachments. Contracts personnel will be tasked to negotiate contract modifications. Program managers or task leaders will then be tasked via the workflow to develop change instructions which in turn will be routed to engineers via the ACMS workflow capabilities. Engineers will design the directed changes using product data checked out from ACMS. The engineers will create new revisions of the product data, but that product data will not be released as the new, baselined revision of the product until after it has gone through a release review. The release review also will be supported by an ACMS workflow. Upon approval of the product data's release (captured electronically in ACMS), a "trusted user" will promote the appropriate revision of the product data to be the new baseline for the product. The "trusted user" also will enter effectivity information relevant to the new, baselined revision of the product data. ACMS will maintain an audit trail of changes. ACMS also will disseminate change notifications to individuals previously identified as needing to know about changes to a product's data.

C.4 TDP Validation.

ACMS will support validation of Technical Data Packages (TDPs) by automatically responding to reprocurement event triggers, assembling a technical data package list (TDPL), presenting links to the data referenced by the TDPL, and then initiating an appropriate TDP review workflow that culminates in approval and certification of the TDP via electronic sign-off. This process starts with the identification of a need for a part by procurement (Inventory Management). A Procurement Work Directive (PWD) and a Procurement Request Order Number (PRON) are generated by the Inventory Manager's system in response to the need to procure a replacement or spares. The process ends when the certified TDP is sent to procurement.

C.4.1 Initiate Validation.

An Inventory Manager, or an automated system supporting Inventory Management, will determine a need to procure replacements or spares. This will result in creation of a PWD and a unique PRON which is sent to the Configuration Manager. If the PRON and PWD were automatically generated and sent to ACMS, then ACMS will automatically respond to this event trigger by searching for the appropriate part, automatically assembling a TDPL, and automatically initiating a TDP review workflow. In the event that the PRON and PWD are not received automatically, then the Configuration Manager will need to access ACMS, find the part via search queries or product structure navigation, and initiate the assembly of the TDPL and links to the associated product data that makes up the TDP. Once the TDPL has been generated and the associated product data linked, the Configuration Manager will initiate an appropriate workflow for review, validation, approval, and certification of the TDP.

C.4.2 Retrieve Supporting Product Data.

Upon notification of an outstanding task, the TDP reviewers will be provided with a means to identify outstanding workflow tasks. The reviewers will select a task on which to work and use ACMS to retrieve the data associated with the TDP. Product data attached to the workflow task will be retrieved directly from ACMS' representation of the task. Any other product data that the reviewer deems necessary will be located and retrieved using ACMS' query/search, product structure navigation, and check-out capabilities. For example, the result of the query will identify product data by its drawing, document, or other product data identifier. This product data will include engineering drawings, models, simulations, specifications, standards, testing requirements, quality requirements required to manufacture an item, associated lists; process descriptions; and change action documentation. Other examples of product data include documents defining physical geometry, material composition, performance characteristics, manufacture, assembly, and acceptance test procedures.

C.4.3 Review and Update TDP.

ACMS will enable TDP reviewers to view and mark-up or redline viewable images of the product data. Where the TDP is incomplete or requires modification, ACMS will enable the Configuration Manager to create, store, and control new product data or make revisions to the existing product data. Often, either of these activities will involve participating in a review of product data or an engineering change action workflow prior to releasing the product data.

C.4.4 Assemble and Certify TDP.

As part of the TDP validation workflow within ACMS, the Configuration Manager will be able to retrieve a TDP Certification Display. The Configuration Manager will fill-in the TDP Certification Display and electronically sign-off on the certification. Once the task is completed, ACMS will route the certification and validated TDP to the Inventory Manager, completing the TDP validation workflow.

APPENDIX D. Glossary

This appendix contains an alphabetical listing of the acronyms and terms used in this specification. Definitions reference MIL-STD-2549 (Configuration Management Data Interface) and/or EIA/IS-649 (Standard for Configuration Management) where appropriate.

Term	Definition
Access Profile	The set of parameters which are used by ACMS to determine whether a user is allowed to act (e.g., read, write, update, delete) on ACMS controlled product data and structures.
Access Rule	A criterion which determines access to specific data or metadata. Multiple access rules may be applied to a single item of product data or metadata.
Action Trigger	See Event Trigger and Timed Trigger.
Ad hoc Query	A request for information from ACMS which has not previously been prepared and executed.
Ad hoc Workflow	A modeled process which is automated and consists of a set of tasks and associated triggers, data, and executors which has not previously been prepared and executed.
Allocated Baseline	The approved allocated configuration data (reference: MIL-STD-2549).
API	Application Program Interface
Application Activity	An activity which has selected an item or a document for use on programs under its control. However, it is not the current document change authority for the document(s) (reference: MIL-STD-2549).
Application Program Interface (API)	The public specification of functions which allow external applications to access the functionality of a particular application program.
Audit Status	A pre-defined category defined by users to inform users of the current standing of an audit. An audit may be performed to validate that specified requirements for a product were achieved in the design. Another audit is performed to validate the as-built item or product against its design.
Authoring Systems	Application software for creating data/documents. Examples include word processing, spreadsheet, briefing, computer-aided design, and computer-aided engineering software.
Baseline Product Structures	A hierarchical collection of all parts, components, and assemblies comprising a particular product at a particular point in time when the product, to include its structure and data, is ready to be baselined.

Term	Definition
Boolean Operations	Mechanisms for combining two or more conditions into a single statement whose result is TRUE or FALSE. Each component condition can be evaluated as TRUE or FALSE. The standard Boolean operations are AND, OR, NOR, XOR (exclusive or), and NOT.
CALS	Commerce At Light Speed
CCB	Configuration Control Board
CDCA	See Current Document Change Authority.
Change Action	Modification of a product and the data and metadata related to the product. Change action examples include engineering change proposals, deviations, waivers.
CI	Configuration Item
CITIS	Contractor Integrated Technical Information Service
CM Activity	Any process associated with establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design and operational information throughout its life. As applied to digital documents, it is the application of configuration management principles to digital documents, their representations, and data files; and the correlation of digital documents to each other and to the products to which they apply. Examples include change processing, configuration auditing, baselining, determining contract requirements, product modifying, and data acceptance.
Commodity Category	A category code that indicates a specific type or group of items to be requisitioned or supplied.
Control Design Part	A part which is composed of other parts. See Support Design Part.
Control Document	A document which is composed of other documents. See Support Document.
Corporate Engineering Data	Data and metadata that is accessible for viewing, printing, and copying by all users, regardless of where that data is stored. Synonyms include enterprise engineering data and enterprise-level engineering data. Synonym for Enterprise-Level Engineering Data.
COTS	Commercial Off-The-Shelf product
CSCI	Computer Software Configuration Item

Term	Definition
Current Document Change Authority (CDCA)	The authority currently responsible for the content of a drawing, specification, or other document and which is the sole authority for approval of changes to that document (reference: MIL-STD-2549).
Data Access	The ability to find and use data at a particular permission level.
Data Control	Capabilities which ensure that data and metadata access is limited to authorized users and to allowed permissions.
Data Item	A generic term to any kind of data. Example data items include models, documents, drawings, and metadata. Some readers may find it useful to think of a data item as an object whose type is data.
Data Vaulting Capabilities	System capabilities which provide for the storage of data and metadata and ensure that access to data is restricted to those with appropriate permissions, that data is updated by only one user at a time, and that updates to data are stored as independent versions.
Digitally Stored Data	Information that is persistently maintained electronically, that is, with no physical form such as paper.
Document	A self-contained body of information or data which can be packaged for delivery on a single medium. Some examples of documents are: drawings, reports, standards, data bases, application software, and engineering designs (reference: MIL-STD-2549). Document is a form of Product Data.
Document Representation	A set of digital files which, when viewed or printed together, collectively represent the entire document (for example, a set of raster files or a set of IGES files). A document may have more than one document representation (reference: MIL-STD-2549).
Document Support	The identification, retrieval, and comparison of documents performed in support of configuration audit activities.
Document Type	A grouping of documents with similar characteristics or purpose.
Drop Box Location	A directory within ACMS that is created to receive data, such as a change action request, which may result in starting a workflow.
Dynamic Interface	A real-time background exchange of data.
Effectivity	A designation defining the point in time, an event, or a product range (e.g., serial, lot number, model, date) at which changes or variances to specific products are to be effected (reference: EIA/IS-649).

Term	Definition
Engineering Change Display	A predefined electronic display that represents a form and is created in ACMS to facilitate description and review of an engineering change action.
Engineering Data	Synonym for product data. See Product Data.
Engineering Data Acquisition	The creation, revision, purchase, conversion, or any other method of obtaining new Army engineering data either authored by the Army, developed for the Army under contract, or purchased by the Army.
Engineering Data List (EDL)	The Engineering Data List (EDL) consists of product drawings and associated lists used as an internal auditing tool for technical data configured against the item.
Engineering Data Management System	Hardware and software providing the mechanisms for storing, protecting, locating and retrieving, changing, and monitoring engineering data and for creating and using metadata describing and relating the engineering data. Provides mechanisms for change management of data and for controlled access to the data and metadata.
Enterprise Data	Data that is owned by the larger organizational entity (in this case the Army) and is needed and used by more than one authorized component of the enterprise (e.g., MSC, depot, program manager, etc.) who may or may not be the creator or owner of the data.
Enterprise Data Management System	A system that aides in the management of enterprise data. Management of enterprise data may include, but is not limited to, one or more of the following data management capabilities: data storage, data security, access control, data location and retrieval, change management, data distribution, and data sharing and exchange.
Enterprise-Level Engineering Data	Synonym for Corporate Engineering Data.
Event Triggers	An ACMS action that initiates a workflow, a workflow task, or another ACMS action. An example of an event may be an electronic sign-off,
Federated System of Systems	A collection of systems that operate in a collective manner while retaining local uniqueness where necessary. For ACMS, the federated systems will be able to share common data and posses common capabilities across the many sites. Each site, however, will have the ability to customize ACMS at an individual site with respect to its data and capabilities.
Frozen Serialized Configuration	The product structure and related data for a configuration item which has been assigned a serial number and whose structure and related data cannot be changed.
Functional Baseline	The approved functional configuration data (reference: MIL-STD-2549).

Term	Definition
Functional Configuration Audit (FCA)	The formal examination of functional characteristics of a configuration item or system prior to acceptance of the design capabilities, special tooling, or developmental testing, to verify that the item has achieved the requirements specified in its functional and/or allocated configuration data (reference: MIL-STD-2549).
GBL	Generic Breakdown List
Government Lead Application Activity (GLAA)	The government's lead authority when more than one exists for an item of engineering data.
Incremental Audit	A partial audit of a product due to (1) the existence of multiple development efforts in support of a single end item, (2) the product is completed incrementally by the developer, or (3) the development effort is simply too large for completion of a single audit.
Incremental Baseline	An approved release of configuration documentation on a given date that is not a functional baseline, allocated baseline, or product baseline. Typically these correspond to a configuration established for a re-procurement action.
IPPM	Integrated Product and Process Management
IPT	Integrated Process Team
LDM	Logical Data Model or Logistics Data Model
Link	A user created element in ACMS which describes a relationship (see relationship) in ACMS. Relationships can be between product structure elements, between product structure elements and data items, or between data items. Synonym for Relationship.
Logical Partition	A conceptual division of a data vault.
Messaging Capabilities	ACMS-generated notifications based on pre-defined event triggers such as workflow initiation, task completion, or data modification. Distribution of the notification may be by utilizing the current e-mail system.
Metadata	Elements of information that describe data, such as document identifier, date, owner, release level, format, keywords, data location, approval authorizations, part identifier, and part name. These elements help users locate and distinguish particular data stored in ACMS or interfacing systems. Metadata is a form of Product Data.
Metadata Default	A value set in ACMS by the system administrator which is applied as the value of the metadata element for a new element of data if the user does not replace it with a different value.
MI	See Modification Instruction

Term	Definition
MIL-STD-2549 Data Information Packets	Information pertaining to drawings, specification, standards, software and software support documents, general documents, product/asset configuration, configuration change control, configuration management action item status, project management, engineering parts list, basic document protection, basic files, and basic document representation is broken into data information input packets. These data information packets define the data and metadata that can reside in the ACMS database. There are 10 packets.
Mission Applications	A software based tool specific to an Army organization's area of responsibility that is used in day-to-day operations.
Modification Instruction (MI)	A document which authorizes and provides information on how, where, and when to implement a change action.
MSC	Major Subordinate Command
Native Format	The file structure produced by the application which created the files.
NIIN	National Item Identification Number
Non-Versioned Data	Electronic information which , when modified and saved, overwrites the file originally containing the information unless specifically instructed by the user to save to a new file.
Non-Versioned Vault	A Data Vault which does not create independent versions of data that is checked in after modification. Access control on the data is maintained.
Off-Line Archival Storage	Persistent maintenance of information on a machine removable media such as tape or CD.
PAN	Procuring Activity Number
PDM	A Product Data Management System is used to organize, access, and control all data related to a product. A PDM system is a type of Engineering Data Management System.
Permission Level	Authorization to exercise particular functions on data and metadata, including create, read, update, and delete.
Physical Configuration Audit (PCA)	The formal examination of the "as-built" configuration of a configuration item against its technical documentation to establish or verify the configuration item's product baseline (reference: MIL-STD-2549).
Product Baseline	The approved product configuration data (reference: MIL-STD-2549).

Term	Definition
Product Data	Documents and metadata related to a product's requirements, design, implementation, and support. Includes documents and files such as engineering drawings, technical manuals, models, parts lists, wire lists, specifications, standards, reports, instructions, requirements, directives, engineering change action documents, diagrams, and schematics. Also includes metadata about documents and product structures. See also Metadata and Document. Synonym for engineering data.
Product Data Attributes	The characteristics of a product that can be used in a search or to describe the product.
Product Structure Elements	The assemblies, components, parts, and material which, when combined, make up a product. Includes the highest level element such as the weapon system or end item. A product structure element may be designated as a CI.
Product Structures	A hierarchical collection of all parts, components, and assemblies comprising a particular product. May include CIs and the highest level element such as the weapon system or end item. A product structure often is represented as a graphical depiction of the relationships among product structure elements.
PRON	Procurement Request Order Number
PWD	Procurement Work Directive
RAM	Random Access Memory
Refresh Time	The time required to update a data element across a distributed database.
Relationship	An association between product structure elements, between a product structure element and data, or between one element of data and another. Examples include composition of a product from assemblies, description of a product by a specification, and composition of a document from chapters. Synonym for Link.
Release	The designation by the originating activity that data, a document representation, or software version is approved by the appropriate authority and is subject to configuration change management procedures (reference: MIL-STD-2549).
Release Level	The state, status, or access level of product data at a point in time during its life cycle. Release levels are defined according to organizational business rules. Example level names are Preliminary Release, Prototype Release, and Production Release. Each Release Level has its own set of business rules that describe authorizations for access, use, and approval.

Term	Definition
Release Status Level	An attribute assigned to data to support the business rules defining access, change management, and archiving of digital data documents The current status of data being reviewed and released. Examples are submitted, pending release, rejected, approved.
Remote User	Any user of a system who must use common user commercial or DoD communications infrastructures to connected to the system. Examples include the Internet, commercial phone networks, and DoD equivalents. Users connected via local area networks or high performance wide area networks are not considered remote users.
Repository System	A legacy system that ACMS will interface with, such as JEDMICS, whose primary function is engineering data storage..
Required Attributes	Metadata that are necessary in order to search for data by groups.
Revision	An identifier that indicates when a document or document representation has been modified or changed.
Role	A method of classifying users, usually based on their particular function on a project or project activity.
Secure Storage	The ability to preclude stored information from being viewed, reused, updated, or deleted without invoking system rules.
SMTP	Simple Mail Transfer Protocol
STEP	STandard for the Exchange of Product model data - ISO 10303
Support Design Part	A part which has a parent, that is, a part which, with other parts, makes up the parent part.
Support Document	A document which has a parent, that is, a document which, with other documents, makes up the parent document.
Synchronized Systems	Systems that store and manage the same data in such a way that a change/revision of data or metadata in one system will be reflected in the second system.
Task Notifications	Part of the workflow execution process, tasking, and instructions necessary for the user to accomplish the workflow assignment.

Term	Definition
TDP	Technical Data Package. A technical description of an item adequate for supporting an acquisition strategy, production, engineering, and logistics support. The description defines the required design configuration and procedures required to ensure adequacy of item performance. It consists of all applicable technical data such as drawings and associated list, specifications, standards, performance requirements, quality assurance provisions, and packaging details (reference: MIL-STD-2549).
TDPL	Technical Data Package List
Tech Loop	The business processes comprising the assembly, review, update (if any), and dissemination of a Technical Data Package.
Technical Baseline (TECHBL)	The collection of documents which are associated with a particular project. Generally, they serve to document the analysis and the rationales which were used to authorize the project to proceed past various milestones.
Technical Data	Synonym for engineering data.
Timed Trigger	An ACMS action that is pre-defined and based on a certain time interval or date.
Transaction Log	An on-going set of records that updates every time a change is made in the database. It is saved externally to the system and contains sufficient information that the system may be restored from a backup or archive.
Version	An identifier used to distinguish one body or set of computer-based data from another. Version identifiers are usually associated with data used by, or maintained in, computers such as files, data bases, and software. Modifications to a version of either software, or a computer data base or a file (resulting in a new version) may require configuration management actions by either the performing activity, the tasking activity, or both (reference: MIL-STD-2549).
Web-based Access	The ability to access and use ACMS through a commercial web browser.
Work Queue	An electronic listing of workflow tasks assigned to a particular ACMS user.
Workflow Capabilities	ACMS functionality associated with the creation, storage, implementation, modification, and monitoring of a pre-defined sequence of tasks and their associated data and executors.